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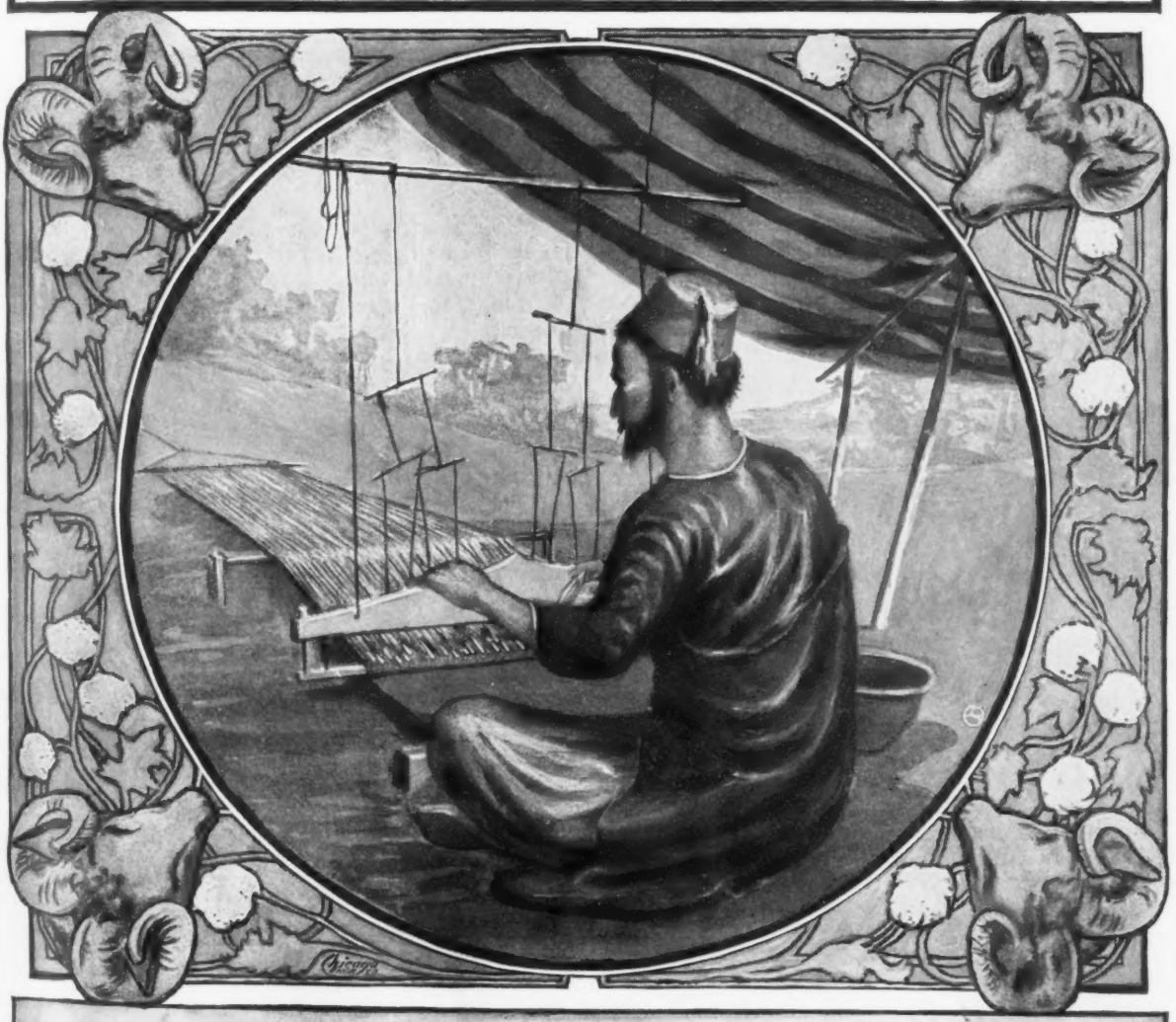
TEXTILE WORLD RECORD



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Correspondence.

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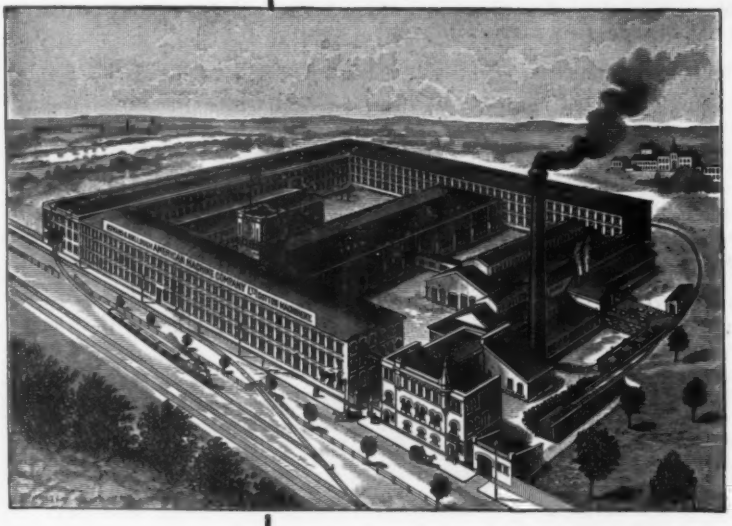

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TEXTILE WORLD RECORD

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The Textile World and Textile Record.

VOL. 39 (NEW SERIES.) August, 1910 No. 5

Monthly Comment.

Imports of Wool.

We import about one-third of the wool we manufacture. Report of the Massachusetts Commission on the Cost of Living.

We import about three-fifths of the wool we manufacture.

Mill Operatives and Cotton Growing.

A few weeks ago the Manchester Guardian published a report of what is probably the strangest phenomenon at present in evidence in the world's cotton trade. It was the following statement of money collected from the working people, chiefly of Lancashire, for the support of the British Cotton Growing Association:

Accrington	$494.90
Ashton	514.50
Bury	274.40
Bolton	764.40
Bacup	24.50
Blackburn	1,019.20
Burnley	1,602.30
Chorley	127.40
Clitheroe	102.90
Colne	166.60
Darwen	735.00
Duginfield	53.90
Dunferline	49.00
Glasgow	14.70
Glassop	269.50
Haslingden	357.70
Heywood	299.90
Hyde	196.00
Lancaster	53.90
Leigh	142.10
Macclesfield	88.20
Manchester	1,073.10
Middleton	200.90
Mossley	137.20
Nelson	249.90
Nottingham	34.30
Oldham	2,974.30
Preston	3,091.90
Rawtenstall	215.60
Rochdale	882.00
Stalybridge	387.10
Stockport	568.40
Tyldesley	19.60
Warrington	24.50
Wigon	200.90
Yorkshire	68.60
	$17,478.30

Under ordinary conditions a suggestion from us regarding the manner in which the workpeople of Lancashire dispose of their earnings would be an unwarranted intrusion in affairs other than our own. But the conditions surrounding these contributions to the support of the British Cotton Growing Association are extraordinary. In the first place any benefit that may result from the use of this money contributed by the people of Lancashire, in the way of increasing the world's cotton supply will inevitably be shared by the mill owners and mill operatives of the United States, as well as by those of Lancashire. It requires a long stretch of the imagination to think of these payments as voluntary contributions. They are the result of a campaign in which governmental, social, commercial and industrial influences have been enlisted. And these influences have been successful to the extent shown in the foregoing statement only when

the appeal for aid has been made to a working population of whom many are working on short time, facing hunger and deprivation because of a shortage in the cotton supply. Under such conditions the operatives have been urged to contribute their earnings to the British Cotton Growing Association in order to save themselves from the hardships they are now suffering. Even if that contention were sound it would afford as much reason for the mill operatives of Charlotte, Fall River, New Bedford, Lowell or Atlanta, as for the workers of Oldham, Stalybridge or Wigan, to contribute to the support of the colonial cotton growing association.

As a matter of fact, however, the contention is unsound. All the evidence goes to show that the British colonies afford a means of increasing the world's cotton supply far inferior to the best. And if the acceptance of contributions from workingpeople for the support of the colonial cotton enterprise is ever justifiable, it will be so only after the other and better sources of supply have been fully developed. We have thought it worth while to make a record of these contributions wrung from English operatives in 1910, and hope there will be no occasion to contrast them with contributions of an entirely different character.

The Impefial Valley.

An exhilarating effect is obtained by reading in this issue the account of cotton growing in the Imperial Valley of California. It reminds one of the enthusiasm and budding hopes of youth. Well it may, for it tells of a country that but a few years ago was a desert. Irrigation has transformed it into a rich and fertile valley, with possibilities in the way of cotton growing that may result in a material addition to our cotton crop. The high hopes of the Californians may not be fully realized, but realization will be more complete if the enthusiasm is not dampened now.

Ireland accounts for about 64 out of every 100 persons employed in linen manufacture in the United Kingdom.

Cotton Bills of Lading.

For years the bills of lading for American cotton have been a cause of serious trouble in the cotton trade. The difficulty arose from the fact that a bill of lading did not necessarily mean that the cotton had been loaded. As a result foreign buyers of cotton were frequently called upon to pay for cotton on presentation of the bill of lading while it was still waiting to be loaded on the cars at some interior point in this country. This loose method of doing business made fraud possible, and at short intervals buyers of cotton would discover that by collusion between supposed shippers and local freight agents in making out fraudulent bills of lading, they had paid for fictitious cotton. A recent occurrence of this kind has aroused the banking and transportation interests to the need of reform. As a result representatives of leading bankers and Southern railroads met last month in New York and adopted a plan which is outlined as follows:

Your committee appointed to consider the form of certificate to be attached to order notify bills of lading for export cotton and the method of their use, recommends the adoption of the certificate in the following form and the following uniform regulations in respect to the issuance of such bills of lading.

(To be attached to Order Notify Bills of Lading for Export Cotton Issued by Agents of this company.)

Bill of Lading Signature Certificate No.....
The.....Railroad Company hereby certifies:
That.....is its regularly appointed.....
Agent at.....and as such is authorized to sign Bills of Lading in accordance with the regulations of this Company, and that the signature on the attached order notify bill of lading No.....
dated.....(Place of Issue.....(Date).....
covering.....Bales of Cotton marked.....
is his signature.
.....(Date)..... .....

We recommend that certificates be handled in the following manner, to wit:

That they be issued in book form, with original, duplicate and stub and numbered consecutively, and that they be prepared by each company on paper bearing its own water marks or color tint protective devices. It is suggested that a uniform size of four (4) inches in width and six (6) inches in length be used. The certifying representative will attach the certificate to the bill of lading with mucilage or paste or an irremovable metal fastener.

The certificates will be issued to the agents in

the same manner as passage tickets and the same check shall be made of these documents in agents' hands as of passage tickets.

On the date of issue the agent will forward to the accounting department the duplicate certificate, with a non-negotiable copy of the bill of lading. The bill of lading, in addition to its own number, shall bear the number of the bill of lading signature certificate, which is issued in connection with it.

The agent affixing the signature certificate to the bill of lading shall, in addition to signing and dating the same and keeping a record of the number, the date and the quantity of cotton called for by said bill of lading and certificate, stamp the same partly on the bill of lading and partly on the certificate in such manner that tampering or irregularity would be apparent.

Spoiled certificates shall be immediately cancelled and returned to the auditor, with report.

It is further recommended that through export bills of lading be issued upon the following conditions:

Agents are to be instructed not to sign bills of lading until the cotton is in possession of the railway company.

It being understood that cotton bills of lading may be issued on loading certificates certifying that cotton is loaded in cars designated by initials and numbers; issued by duly authorized agents of compress or warehouse companies that have executed the usual contract and bonds with the railway company, but not otherwise.

Bills of lading will be issued only by agents or other representatives of the company, who are duly authorized to do so.

Only one original bill of lading shall be issued for each shipment. The practice of issuing duplicate and triplicate bills of lading will be discontinued, but as many copies as are reasonably required may be issued, provided they are endorsed "Copy, not negotiable."

The number of bales of cotton and the marks shall be written in pen and ink in the original bill of lading and not inserted with typewriter or any other manner.

There shall be no additions, erasures or changes in bills of lading.

Bills of lading will be issued in serial numbers, beginning with No. 1 at each issuing station on the 1st of September of each year. All copies of bills of lading shall bear the same number as the original.

A copy of each bill of lading will be forwarded on the date issued to the agent of the water carrier at the port of export, in the case of direct shipments, or at the port of transshipment, in the case of indirect shipments.

The shipper is required to accept the conditions of the bill of lading by attaching his signature or the signature of his authorized representative to the original agent's copy.

It was announced that a committee representing the bankers and railroads would be sent to Europe to obtain the cooperation of European bankers and cotton buyers.

Wool and Cotton at the Same Price.

Last month the editor of the "Worcester Telegram"startled the world with the discovery, not of the North Pole, but of the fact that cotton and wool are selling at the same price. The announcement was made in this fashion.

Cotton is selling for 16 1/2 cents a pound and a trifle more as the waves of speculation run wild, and Eastern manufacturers are coming home from Montana with their faces wreathed in smiles because they have bought thousands of pounds of wool at 17 cents a pound. It is almost a tie between cotton and wool as to price. Another year the dealers should not have to bother their consciences by guaranteeing to their customers that there is no cotton in the clothes. All the garments can now be made to better advantage of wool, because of the assurance that the material will wear better, look better and sell better.

Then the Telegram produced this testimony from a period more or less remote:

One old Worcester farmer's boy said yesterday that he remembered many years ago asking his father why it was that cotton sold for less than 9 cents a pound and wool for 40 cents or more, and that his father regarded him with a look of pity for a minute and then said: "Because a pound of wool is worth more than four times as much as a pound of cotton for making cloth, and always was and always will be, you simple boy, and don't forget that?"

He has obeyed his father by not forgetting that, but the boy is now older, and has had a good deal of experience, and he wonders how he would answer his son if he should ask him: "How is it that cotton goods are cheaper than woolen while the raw materials cost about the same price?"

Fortunately for the son the old man cannot return to be asked that fool question and to give his offspring a well-merited castigation.

Unfortunately for the public editors of the daily papers can publish such rubbish without receiving suitable punishment. The guilt of the "Telegram" is the greater because that newspaper is located in the center of the State which leads in the manufacture of wool goods. It is not to be expected that the editor of a daily newspaper will have expert technical knowledge of the various industries of his district, but the public have a right to expect that he will acquire at least an elementary knowledge of an industry before he proceeds to discuss it. Taking that precaution would have saved the editor

of the Telegram from ignorance of the fact that 100 pounds of the wool that sells for 17 cents would produce approximately but 22 pounds of cloth, while 100 pounds of the cotton selling for 16 1/2 cents would produce about 85 pounds of cloth, thus making the cost of the wool for a pound of cloth 76 cents, and the cost of cotton for a pound of cloth 19 1/2 cents.

If the editor of the Telegram had taken the precaution to investigate before writing he would easily have learned that there has been no time at which the price of wool and of cotton have not been the same; no time at which the price of cotton has not been higher than the price of wool; and no time at which the price of wool has not been higher than the price of cotton; these apparently paradoxical conditions depending on the quality of the cotton, and on the quality and shrinkage of the wool selected for comparison.

It is by such inexcusable ignorance as that of the Telegram that the public are misled. In the case just cited the Telegram undertakes to draw conclusions from its discovery in this sapient fashion:

> The conditions are changing all the time in this country, and the Democrats may be telling us this fall that the trouble is with the tariff, there being no tariff on cotton it has gone up to over 16 cents a pound, and there being a tariff on wool, it has gone down to a trifle more than 16 cents a pound.
>
> That will be a poser if the Democrats insist on making it a prominent item. It may well fease the greatest of philosophers. The simple explanation might be that the tariff on wool has caused so many to produce it that it has gone way down in price; but the fact is that there is so little wool produced in this country that the price should be extremely high if the demand could not be better satisfied from foreign countries, better so far as the wool buyers rate it.

Such is the rubbish from the Heart of the Commonwealth.

The exports to the United States from Bradford during February, 1910, amounted to $1,707,871, an increase of $200,747 over February, 1909. The largest item was wool, $534,328, of which $238,892 was British and $295,436 colonial and other wool.

The Fall River Sliding Scale.

The sliding scale for regulating wages in the cotton mills of Fall River has existed only in name since Nov. 19, 1908, when the mill owners waived their right to reduce wages under that agreement. The right was relinquished for the second time in May, 1909, and again in November of the same year. In May, 1910, an attempt was made to amend the agreement so as to make it a working arrangement. The employers and operatives could not come to terms and the abandonment of the sliding scale, which actually occurred in 1908, was formally announced. Nevertheless this attempt to bring about the automatic regulation of wages has been of great value to the cotton trade. It has brought home to mill owners, operatives and the public the fact that there is a better way to fix the rate of wages than by a continued trial of strength. The question of increasing or decreasing wages will again come up for settlement at Fall River, and then we shall have evidence of the good effect this sliding scale experiment has had on men's minds. As a matter of record we give the course of prices and the average margin for the six months ending May 28, 1910, also the chart showing the course of wages since January, 1884:

	Cotton	28 Inch 64 x 64	32½ Inch 64 x 64	Margin Av. for wk.)
1909				
Dec. 4	14.65⅝	4	6	72.0633
11	14.94⅛	4	6	69.7967
18	15.15	4	6	68.1300
25	15.49⅛	4	6	65.3967
1910				
Jan. 1	15.96	4	6	61.6500
8	15.74	4 1/10	6	63.9725
15	15.16⅔	4¼	6	73.6217
22	14.26⅛	4¼	6	80.8217
29	14 55/8	4¼	6	78.4883
Feb. 5	14.71⅓	4¼	5 4/8	75.4972
12	15.15	4¼	5⅝	70.9958
19	14.91	4¼	5 7/16	70 7085
26	14.39	4¼	5⅝	73.6269
Mar. 5	14.88⅓	4 5/24	5 2/8	67.0182
12	14 85	4¼	5½	67 8775
19	15.14⅛	4¼	5½	65.5442
26	15.12½	4¼	5½	65 6775
Apr. 2	15.17½	4¼	5½	65 2775
9	14.86⅓	4¼	5½	67.7442
16	15.21½	4¼	5½	64.9442
23	15.16⅔	4¼	5½	65.3442
30	15.13⅓	4 1/24	5 7/24	57.4744

May 7	15.26$\frac{2}{8}$	4	5$\frac{3}{16}$	53.7457
14	15.70$\frac{2}{8}$	4	5$\frac{1}{8}$	49.1777
21	15.56$\frac{2}{8}$	4	5$\frac{11}{16}$	52.0355
28	15.38$\frac{1}{8}$	4	5$\frac{1}{4}$	54.2471
		Average Margin		66.1491

The latest sliding scale agreement failed because it did not conform sufficiently to the law of supply and demand. It was based on the assumption that the balance of supply and demand in the case of raw cotton and two grades of print cloth afforded an adequate basis for the regulation of the price of labor in the mills. The defect consisted in leaving out of consideration the general balance between the supply of and demand for labor in all the industries of the country. Whether a sliding scale can be framed to avoid the defect of the one recently abandoned is a question that awaits solution.

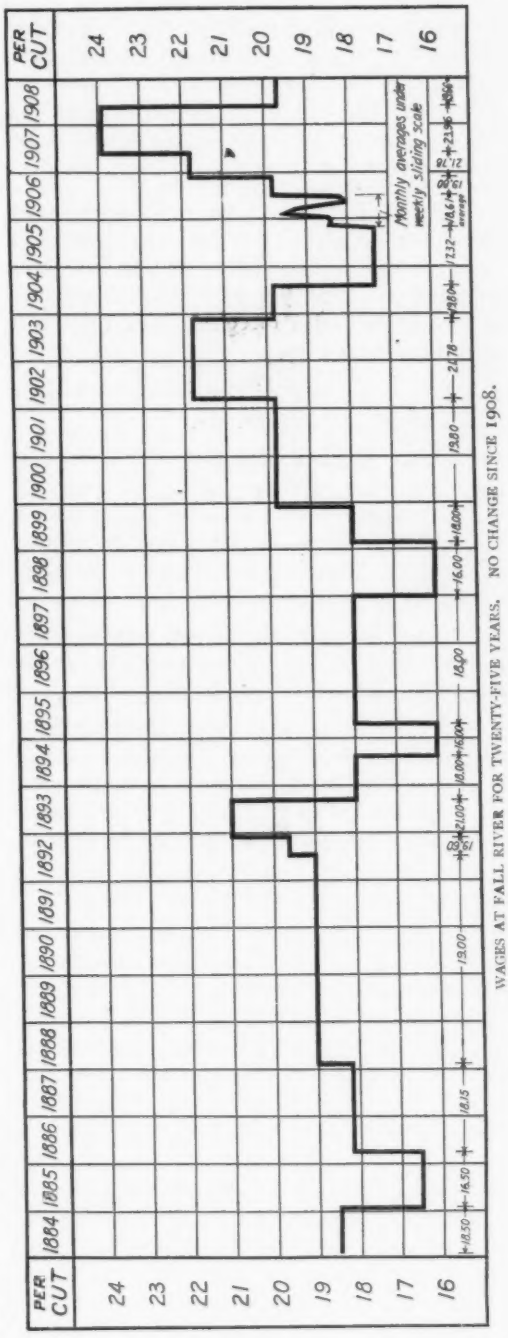
Cotton Yarn Mills in Germany.

The census of cotton spinning mills compiled by the German government has recently been issued for 1907. This is a rather belated return, but is the latest official report available. Of the 401 cotton yarn mills in Germany, 383 filed reports, 4 mills were so small as to be negligible, the figures for 13 were estimated, thus leaving only one mill of importance out of the census, which is summarized as follows:

Spindles:	
Mule	5,337,231
Ring	4,098,657
	9,435,888
Cotton used:	
American	575,275,934 lbs.
East Indian	153,439,246 lbs.
Egyptian	73,813,461 lbs.
Waste	93,881,337 lbs.
Total cotton	896,409,978 lbs.
Yarn spun, single	789,657,066 lbs.
Value of yarn spun	$154,671,457

The world's production of cotton in 1909 amounted to about 8,279,000,000 pounds, with an estimated value of about $1,000,000,000.

The production of cotton in Brazil in 1909 is estimated at 360,000 bales of 500 pounds each, while the production in 1908 was about 425,000 bales.



WAGES AT FALL RIVER FOR TWENTY-FIVE YEARS. NO CHANGE SINCE 1908.

EVENTS OF INTEREST IN THE TEXTILE TRADE.

July 1. It is announced that the Tariff Board has begun "a thorough and scientific revision of the Payne tariff law," and that President Taft has given the Board instructions to get at the truth regardless of whom it helps or hurts.

July 1. Commissioner of Weights and Measures Driscoll, of New York, sends a letter to dry goods dealers calling attention to trade customs by which textile goods are falsely labeled and directing that the practices be stopped.

July 2. Meeting of the Southern Textile Association at Augusta, Ga.

July 3. Marshall Field & Co. state that their purchase of cotton mills at Spray, N. C., "is of great significance in that it means the merging of manufacturer and distributor to meet the changing conditions in the marketing of merchandise."

July 3. A cotton and kapok exhibition at Zittau, Germany, under the auspices of the Chemnitz spinners.

July 5. The German Wool Growing Syndicate held a meeting at Berlin and passed strong resolutions in favor of extending the growing of wool in Germany and in German colonies. The rapidly increasing imports of foreign wool into Germany were cited as a reason for prompt and energetic action.

July 6. Representatives of wholesale dry goods firms at New York meet Commissioner Driscoll and agree to discontinue the false marking of goods to indicate weight and measure. H. B. Claflin & Co. cable their European representatives to mark goods for export to the United States with actual weights and measures only.

July 15. The employers and operatives in Lancashire cotton trade reach an agreement by which the present rate of wages is to continue without change for five years from date and that agreements made thereafter shall continue for at least two years.

July 26. A conference of bank officers and railroad officials in New York recommend a system by which cotton bills of lading will be validated by the railroads when the cotton is received for shipment. It was decided to send a committee to Europe to obtain the approval and cooperation of the foreign banking and cotton trade interests.

THE TARIFF ON COTTON GOODS.

The criticism of the Payne tariff bill since it became a law on August 5, 1909, has been directed mainly against the wool and wool goods schedule. Recently, however, there has been a disposition to attack other schedules. The August issue of "World's Work," contains a severe arraingnment of the tariff on cotton goods and the methods by which it was framed in the House and Senate last year. Charges are made that the cotton tariff was revised upwards by devious methods through a deal between Senator Aldrich, James R. MacColl and Henry F. Lippitt.

In view of the wide circulation given to the charges, it seems to us but fair that we should give the following reply made by Messrs. MacColl and Lippitt immediately on the appearance of the article in "World's Work:"

A few importers in New York are carrying on a persistent attack on the cotton schedule of the Payne-Aldrich bill through magazines and newspapers, claiming that it has increased the price of all the cotton goods used in this country to the consumer. Their ultimate purpose is, of course, to bring about a revision which will enable them to import more goods and increase their profits.

In the current number of World's Work there is an article on the cotton tariff which is of a similar character. It claims that the price of cotton cloth consumed in this country has been advanced because of the tariff. The author might as well write an article to prove that the stock market has advanced during the last year on account of the tariff law.

Every intelligent man knows that the stock market has distinctly declined, and also that cotton goods are cheaper today than they were a year ago. It may be safely stated that most classes of cotton goods are now selling by manufacturers at lower prices than they were previous to the passage of the tariff, and it would be impossible to find any fabric that is not selling cheaper, making proper allowance for the difference in the cost of the raw material. A crop of 10,500,000 bales in 1900, against 13,500,000 bales in 1908, has increased the price of the raw material about 50 per cent.

It is only necessary to point out a few of the erratic and misleading statements that are made in this article in order to demonstrate its unreliability. A man in Washington has to pay $3 for a shirt for which last year he paid $2.25. "The shirt maker explained that the goods that he wanted had a few stripes of mercerized thread in it, and that this was responsible for the increase in the cost."

The duty imposed on mercerized goods is one cent per square yard. It takes not over three and one-half square yards to make a shirt, therefore the tariff could not be held responsible for more than three and one-half cents out of the 75 cents, which the shirt cost additional. It is stated that this fabric was made by the Manville Company. The Manville Company does not make any goods of this kind.

A woman in Cleveland, O., says: "I have three little girls in school, and ordinary cotton cloths are so much more this year than last year that we have to skimp and scrape and save every penny to make them look decent." The article states that "the cloth for the children's dresses is made by the Lorraine Manufacturing Company of Rhode Island."

As the Lorraine Manufacturing Company does not make ordinary cotton cloth the statement is probably incorrect, but if the goods referred to were Lorraine, they must have been manufactured last year for this spring's business, and were sold by the Lorraine Manufacturing Company, previous to the passage of the tariff, on the basis of the low-priced cotton of the 1908 crop and without any advance whatever.

It is stated, "These three concerns control the cotton yarn industry of the United States, and are closely allied to the other group of mills that control the cotton cloth industry." As a matter of fact there are no three concerns that control the industry, and further there are no large combinations in the cotton industry. There are two or three concerns that each control 500,000 spindles out of a total of 27,000,000, but the average as shown by the Government census figures is about 25,000 spindles to each concern. There is no business that has freer and fiercer competition than the cotton industry in this country.

It is stated with regard to the Dingley law that Mr. Lippitt said, "I know I am right, because I wrote the cotton cloth schedule myself." The Dingley cotton schedule was largely a reproduction of the Wilson law. Mr. Lippitt did not write it, and never made such a statement.

The whole argument regarding colored figures, is not correct in fact, entirely misleading, and can readily be disproved.

The following quotation is from the report submitted to the ways and means committee by an independent customs expert, Mr. Doherty, who was employed by them to investigate decisions of the Board of Appraisers and Courts under the Dingley law: "The three cases cited above are illustrations of the preposterous claims which importers of cotton cloth are urging upon the courts and the Board. They are based, of course, upon the decision in the Beer case, supra, which now stands for the proposition that the only portion of a figured cotton cloth that needs to be considered for the purposes of tariff classification is the foundation or groundwork of the fabric. This rule was applied, in the face of all sense and reason, in the Rusch case, supra, to colored cotton cloth. Some of the cloth in this case was entirely covered with colored designs, no white whatever being visible, and yet the learned court solemnly declared it not to be a colored cotton cloth."

The World's Work article says: "It was further discovered that Senator Aldrich had eliminated altogether that class of goods counting less than 50 threads to the square inch. This simple operation had the effect of just doubling the duty on the cheapest cotton goods manufactured."

This is not correct. Goods of less than 50 threads are not eliminated, as anyone can see by reading the present law, paragraph 315. Moreover, hardly any cotton goods are made counting less than 50 threads to the square inch, and at no time did the importations amount to more than $30,000 per annum under the Dingley law.

This article starts with two mistaken statements to show that cotton goods have been made higher by the new tariff and then goes on to show why. Anybody who knows anything about the cotton manufacturing situation knows that cotton goods are not higher now than at the passage of the present tariff bill. In nearly every case they are materially lower, and so low that a very large proportion of the cotton spindles of America are idle and the industry is in a state of unprecedented prostration.

It is evident, therefore, that the present tariff cannot have caused higher prices, as they do not exist. Moreover, the reasons given for the tariff producing a situation which does not exist are full of misstatements, as these illustrations clearly show.

James R. MacColl,
Henry F. Lippitt.

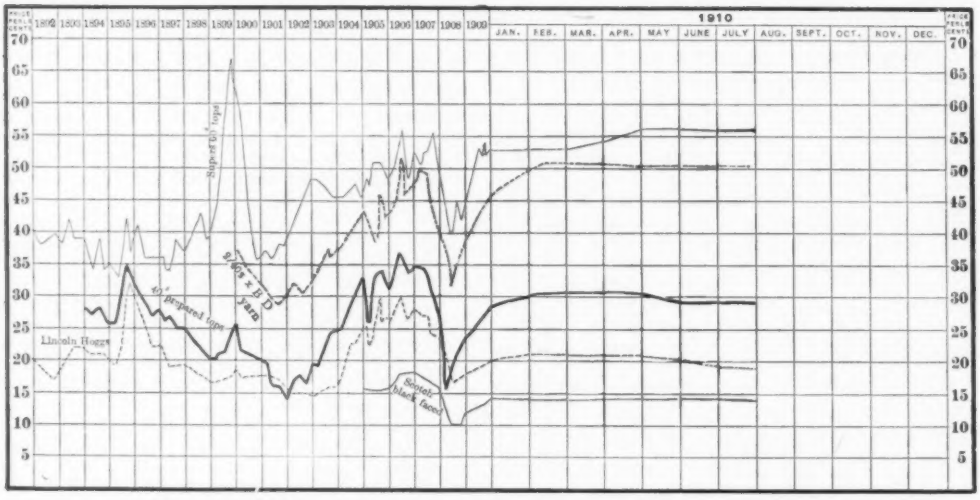
PICKING COTTON BY MACHINERY.

Editor Textile World Record:

On pages 58 and 59 of your July issue I find that you comment on "picking cotton by machinery." This interests me and you will pardon me for drawing your attention at this time to the fact that I believe this is another edition of the machine described in my article which appeared in your issue of February, 1905, entitled "Mechanical Cotton Picking," and in another article, "Manufacturing Tests of Machine Picked Cotton," which appeared in the "Textile World" of December, 1902. You surely got in early on this branch of the industry.

J. T. Broadbent.

Of all the workpeople engaged in the cotton industry, Lancashire alone accounts for about 83 per cent.



COURSE OF PRICES FOR WOOL, TOPS AND WORSTED YARN AT BRADFORD, ENGLAND.

THE BRADFORD MARKET.

Bradford, Eng., July 27, 1910.

The wool market is firmer after an interval of uncertainty. A heavy fall in London might have sent weak holders off their balance and must have added insecurity to the position. The slight decline has confirmed the best hopes of the trade and it simplifies everything. Spinners did not want a drop that would unsettle their old contracts and are content with their margin if only it can be maintained. The pressure for deliveries has been slackening and the fine worsted cloth trade though employed fully is not overworked. In the dress goods branch there are looms standing. Until the British and Continental holidays and harvests are out of the way no renewed demand for manufactures is expected.

The wool put up at English country auctions has all been absorbed and the purchases have been evenly distributed to a striking degree. No one dealer seems to have bought disproportionately and this fact is found encouraging although buyers at country fairs are by no means all able to get their own money for the wool in Bradford. Down wools, half breds and Lincoln wethers are doing best.

The heaviest fall in London colonial auctions has been in slipes. The fall from 1 cent to 2 cents in slipes has taken immediate effect on the price of noils, which have gone back 1 cent all round in a fortnight and are now the topmaker's despair. Forties noils are selling at 16 to 17 cents; sixties noils, from 27 to 30 cents. Fifties noils worth 19 cents a month ago are not better than 17 1/2 cents today and holders much against their will are letting noils go at these prices. The production is very large and there is no prospect of higher prices in sight, although the carded woolen trade is exceedingly busy.

France ranks third in the exports of cotton goods, which in 1908 were valued at $58,859,403. During the same year the country imported 1,238,121 bales of cotton and exported 214,873 bales.

While in 1908 Germany sent to America goods valued at $160,000,000, America shipped to Germany, our second best customer among nations, $3,000,000 of products.

During 1908 there were 1,085,800,000 bales of jute exported from India, a decrease of 26,600,000 over 1907. Of this number North America took 47,900,000 bales and Europe 9,000,000 bales.

BUREAUCRAT AND BREAKFAST IN GERMANY.

(*From Leipziger-Faerber und Zeugdrucker-Zeitung.*)

(Translated from the German by the Editor of the Textile World Record.)

Complaints have been raised so often regarding the bureaucratic system that it is easy to understand the general unwillingness to cite small details illustrating its defects. At times, however, the disregard of time and money shown by St. Bureaucrat becomes so glaring that a criticism is unavoidable. We find such a case in the recently published report of the Prussian Government for 1909. The industrial inspectors were ordered last year to investigate and report upon the following question: "Have the workmen had breakfast before beginning work in the morning?" With the characteristic conscientiousness of Prussian officials, the inspectors devoted themselves assiduously to securing information bearing on this question, placed a record of the results on paper and presented the reports to their immediate superiors, who in turn transmitted them to the higher officials until they finally reached the central authority where they were subjected to final examination and rearrangement. The published report is entitled "Breakfast Absorption by Workmen before Beginning Work," and is arranged under about forty sub-heads.

A strict system must be observed in such matters. Detailed information is given as to whether the workpeople breakfasted or not and the reasons therefore. Reports were made of those cases where definite information could not be obtained, also as to the interest which the employers took in the breakfast nourishment of their work people. We are also informed by this report how the various groups of workpeople breakfast; for example, the married employes, the skilled workers, the somnambulist and the temporary workmen. The report also deals with the influence of the location of the worker's home, the time at which work is begun, the conditions in the household and the customs on Sundays and holidays. All these features were carefully considered in this report on the breakfast of the workers. As might be expected, details as to what the breakfast consisted of were not forgotten. Accordingly we learn that in Lueneburg there is the pleasing custom of having fresh buckwheat cakes before beginning work. Attention is given to the manner in which the second breakfast is arranged after work is begun and the provision made for it. In short, the breakfast of the factory worker is shown in all of its many variations.

Whoever reads this report will be enlightened on the following points: The majority of the workers are accustomed before going to work to have a drink of coffee and a piece of bread at the house. A number, however, take this nourishment on the way to work, for various reasons; such as getting up too late, having no appetite at the house, or unfavorable domestic conditions. Many of the factory workers take a roll or a slice of bread, eating it on the way to work or when the mill is reached. Others delay their breakfast until the time the mill stops for the second breakfast, which is generally about 8 o'clock. The day after Sunday and holidays more of the workers go without breakfast. As might be expected, the Prussian factory worker follows no strict rule in taking breakfast, the personal and local conditions as well as other things deciding the matter.

Special value is placed on the arrangement by which the mill is stopped to give the workers a chance to take a second breakfast and the employer is constrained to make the conditions for this breakfast as favorable as possible, such as setting aside special rooms, providing hot water, heating the rooms, and giving a free drink of some alcoholic beverage. Finally it is stated that many of the workpeople, "from a false sense of shame," refused to give the inspectors an insight into their breakfast habits. It will be readily understood that great weight is placed by the officials on the information thus collected, on the ground that it is designed to better the breakfast conditions of the working people, and it seems reasonably certain that the report will be followed by socialistic propositions for new laws to be

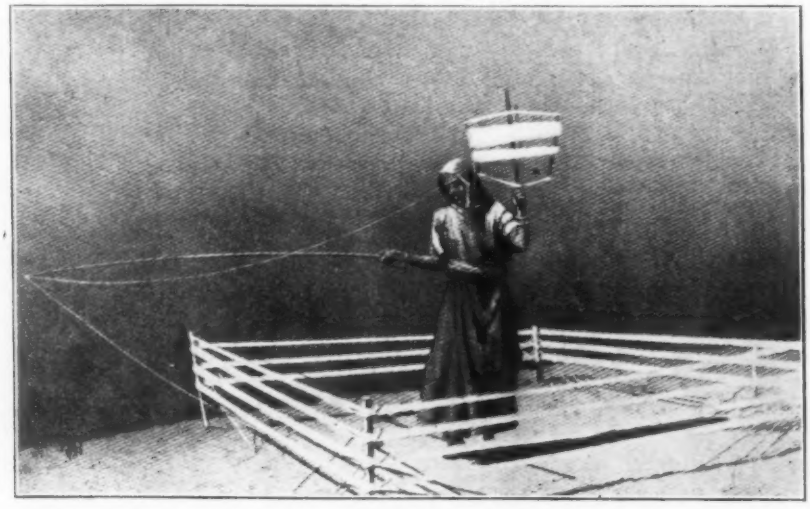
placed on the statute book. While waiting for this result we venture to ask what government organ will be the first to express concern as to the manner in which breakfast is taken by the independent hand worker, or the many work people aside from factory workers who are accustomed to live from hand to mouth. For many years the socialist party has sought to increase the number of industrial inspectors by claiming that these officials are overworked and unable to perform their duties properly. At times problems are proposed for solution the necessity for which only bureaucratic urgency can justify. A device for several hundred additional officials is created in order to obtain information regarding the private affairs of the individual. Have our officials in Prussia nothing better to do?

The average value of raw cotton imported into England in the course of a year is about $300,000,000.

Raw cotton is the largest single import of Germany, and manufactured cotton the largest export. Germany is the second largest importer of cotton in the world and the second largest exporter of cotton goods.

ARNO SCHMIDT IN INDIA.

Last year the International Federation of Cotton Spinners' and Manufacturers' Associations sent its secretary, Arno Schmidt, to India to persuade the Indian spinners and manufacturers to join the International Federation. He was also instructed to arrange if possible for increased statistical reports to the Federation by the Indian cotton trade and to study the cotton growing Federation, and to study the coton growing industry in India with special reference to the possibilities of its extension. Mr. Schmidt returned from this journey early in the present year and presented his report at the recent Cotton Congress at Brussels. The report is in part as follows:



WARPING FOR NATIVE LOOMS AT AHMEDABAD.

I reached Bombay on Nov. 26, 1909, and had to arrange my departure from India for Jan. 20, 1910, as urgent business made it necessary that I should return to headquarters by the end of February, where preparations for the half-yearly international statistics and work connected with the forthcoming Congress demanded by attention. My stay in India was therefore barely eight weeks, and as the various centers of the cotton industry are long distances apart, I traveled by rail almost 4,000 miles.

I have adopted the following division in preparing my report:

(1) Organization.
(2) Cotton Industry.
(3) Cotton Growing.

ORGANIZATION.

Bombay.—The Bombay Millowners' Association, which was established in 1875, is the most important of all the Indian Master Cotton Spinners' and Manufacturers' Associations. I visited during the first week most of the members of the Committee of that Association, and explained to them individually the aims and objects of the International Federation. A meeting of the Committee was then called for Dec. 2, 1909, at which I delivered an address.

[The concluding portion of Mr. Schmidt's address at Bombay is as follows:]

By joining hands with European spinners you ought to be able to enlist their support for increasing cotton cultivation in your country, and thus you will have a larger supply of your raw material; you will also increase in this manner the spending power of the agricultural laborer and consequently improve your own market.

As a last direct advantage I may cite the opportunity of obtaining valuable information as regards the manner in which certain difficulties are settled in the various Associations, how they are organized, what rules and regulations they possess, etc. In fact, the Manchester office will always be ready to obtain and disseminate information regarding the cotton industry and commerce.

In the place of the Chambers of Commerce, dealing with a number of trades, the important industries require special Associations, and the International Federation of Master Cotton Spinners' and Manufacturers' Associations may be compared to an International Chamber of Commerce for the cotton industry. The International Federation exists to improve, through joint action, the position of the cotton industry as a whole, and to abolish common dangers.

The Committee has made it a principle not to deal with politics, or with questions relating to operatives or working hours, fully recognizing that conditions in different countries are so varied that each nation must be left to decide which course is best in its own interest.

In concluding my remarks I wish to refer to the Statutes, which you will find at the end of the official report. As mentioned before, whatever resolutions may be adopted by the Congress or by the Committee, they are only in the form of a recommendation. If local conditions in any one country do not admit of conforming to the terms of the resolution, they cannot be enforced; for instance, in case of a cotton famine or of an overproduction of yarns or cloth, the International Federation may recommend the working of short time, but each affiliated Association would decide whether the local conditions warrant such a policy or not.

Those countries having in membership with the International Federation at least 750,000 spindles, or its equivalent in spindles and looms (one loom equal to 25 spindles), have the right of appointing a representative on the International Committee.

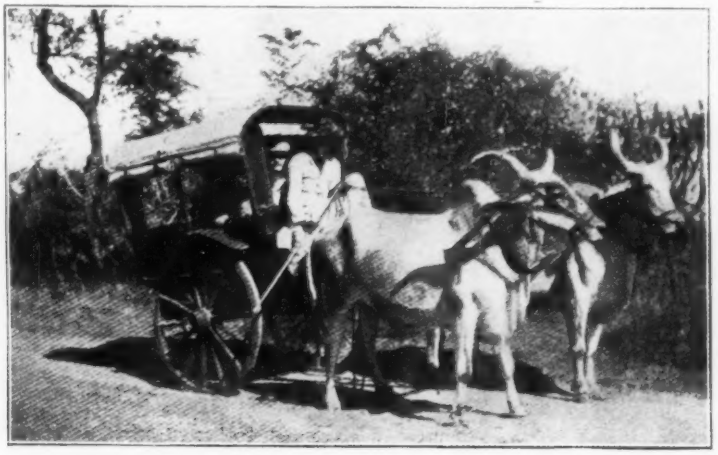
The annual contribution or levy to the International Federation is a very moderate one; it is at present 1/100 penny per spindle equals 100 spindles pay 1d. p. a., 1/4 per loom, plus 20 per cent.

An entrance fee of the same amount is charged in addition to the first year's levy.

This contribution is a trifle, in fact it is no more for the average millowner of India than the annual subscription to a textile journal, as 20,000 spindles would pay yearly 16s. 8d. (Rs. 12.8). Each millowner receives our annual Congress report, which alone is worth that money.

I thank you for the kind attention you have given to this short report, and I trust that you will decide to become members of this important World Federation of Cotton Spinners and Manufacturers.

After some discussion, the following resolution



THE SECRETARY ON THE WAY TO THE NADIAD GOVERNMENT EXPERIMENTAL FARM.

was unanimously adopted by the Committee of the Bombay Millowners' Association:

"That the Committee, having heard Mr. Arno Schmidt's address, are unanimously of the opinion that this Association should be enrolled as members of the International Federation of Master Cotton Spinners' and Manufacturers' Associations, and that steps should be taken to place the matter before the members of the Millowners' Association at an early date."

The Committee of the Bombay Millowners' Association had this address printed and circulated among all the members of the Association, and called a general meeting for Jan. 11, 1910, for confirmation of this resolution. It was the wish of the Committee that I should address the general meeting, and accordingly I gave a similar address, explaining also the attitude taken up by the other Indian Millowners' Associations. At the end of this general meeting the following resolution was unanimously adopted:

"That the members of the Bombay Millowners' Association agree that the Association be affiliated to the International Federation of Master Cotton Spinners' and Manufacturers' Associations, and that the Committee be authorized to take all steps necessary for such affiliation."

At all the meetings in India I delivered addresses on the lines of that circulated by the Bombay Association.

Agra and Cawnpore.—Through the Chamber of Commerce at Cawnpore a meeting was called at which the millowners of the district agreed to form a cotton section under the auspices of the Chamber of Commerce, and to become affiliated to the International Federation.

Delhi.—I gave an invitation to the Delhi Mill Owners' Association to attend the meeting held at Cawnpore, and their representative informed the meeting that the Delhi Mill Owners' Association had authorized him to have his Association enrolled as a member of the International Federation.

Calcutta.—The cotton millowners of this district had likewise no association, and through the medium of the Bengal Chamber of Commerce, I showed them the necessity for organization, and of joining the International Federation. As at Cawnpore, a cotton section was formed in the Bengal Chamber of Commerce, and this section has become affiliated with us.

Madras.—The cotton millowners of Madras and Southern India also formed an Association on my suggestion; it is styled "The Madras and Southern India Millowners Association," and has now joined the International Federation.

Ahmedabad.—This is an important center of the cotton industry, and a Millowners' Association has been in existence for some years. The mills in this district are owned exclusively by natives, who have not come much in contact with Western ideas. They speak Gujurati, and although most of them know some English, I am convinced, judging by the questions put to me after my address, that many of them could not follow a discussion in English on an economic subject, such as that with which we were dealing. A unanimous vote in favor of joining the Federation could not be obtained, and it was therefore decided to translate by address into the vernacular and to distribute copies of it among the members, and to obtain their decision individually. I have not yet been informed as to the definite result of these steps; in any case, some of the mills at Ahmedabad belong to the Bombay Millowners' Association.

INDIAN COTTON INDUSTRY.

The first cotton spinning mill was built in 1817 on the banks of the Hoogly, near Calcutta, and it was called the "Bowreah Mills." It passed through several unsuccessful years, and beyond that no record of it seems to be known. The present Bowreah Mills are a successful concern built in the place of the first Indian cotton mill and managed by Messrs. Kettlewell, Bullen & Co. In 1851 another cotton mill was established at Broach, and in 1854 Bombay received its first cotton spinning mill. Since then the progress in mill building has been rapid.

Hand-loom weaving is carried on largely by the natives all over India, and the fact that there is no excise duty on hand-loom woven goods, while the manufacturers have to pay 3 1/2 per cent. ad valorem on their production, is a great source of dissatisfaction to the manufacturers. The block-printing of the natives in Ahmedabad has become quite a big industry.

Most of the mills in India are owned by limited companies. They are sometimes managed, however, by separate firms, some of whom may partly own and manage several mills. These firms are usually paid on the quantity of yarn and cloth produced regardless of profit, counts, reed and pick. Latterly, however, a few firms have introduced the system of being paid on the profits of the company alone.

The machinery used in Indian cotton mills is exclusively of English make, spinning machinery being mostly supplied by Platt Bros., Asa Lees & Co., Howard & Bullough; looms by Dickens (now Blackburn Loom Company), Livesey, and others; bobbins and shuttles are mostly those of Wilson Bros. Bobbin Company. Other makes are also in use, but machinery by the above makers I have found in the mills which I have visited.

LABOR.

As regards labor, the Indian mill owners are severely handicapped. The mill operatives really belong to the agricultural class, and although one may find in Bombay and Ahmedabad—the principal centers of the textile industry—men who have given up agricultural work, by far the large majority are field laborers. It is the aim of most of them to possess a small piece of land in their native district. This they cultivate. One result is that the mill operative absents himself frequently, and in most cases without leave. He will be away from the mill for several months together, and indeed, looks upon factory employment more as a makeshift. It is often the case that the operatives are too lazy to come to work, and in some places men are specially kept whose duty it is to "drum" the workpeople together. It is a striking picture when visiting a mill to see in the mill yard

large numbers of operatives loitering about, crouching down, and chewing, drinking, washing, or even sleepng. There is an incessant string of operatives going in and out of the mill.

The climatic conditions do not permit of anything like continuous work in the mill; it is, however, not so much overstrain as laziness which is responsible for this loitering of the operatives. Intermittent work has become such a fashion that mill owners now frequently pay a premium to those who have worked all the week or the month without absenting themselves for a day from the mill. Under such conditions it has become imperative for the employer to engage about 25 per cent. more people than he requires every day. I have been given the list of attendance of the operatives of a mill, and the average number of absentees during October and November, 1909, was, according to these lists, 212 and 240 out of a total of 890 workpeople necessary for a spinning mill of 23,424 spindles. In some of the departments 67 out of 183 did not attend on certain days, with the result that at times the card or spinning room had to be stopped owing to the unexpected absence of the workpeople.

At all the mills there are a number of casual workers who never work more than half-time. The Indian mill worker does not seem to possess the slightest degree of energy; he is content to continue the same kind of work at which he started his mill life. I have been assured that increased incomes lead the coolies to dissipation and vice. Women are only employed in the reeling rooms, although in a few cases I have seen them at work at a ring frame. The mill workers are very independent, and apt to take offence easily. The fact that there is such a scarcity of trained operatives confirms them in this attitude and places the employer at the mercy of the operatives' vagaries. These people require such a very small amount of money for their necessities, a few coppers a day will provide food for a family; their clothing is reduced to an absolute minimum, and their furniture consists of a few boxes and a low wooden bed frame covered with coir netting. I have been in a room where three families lived together; the room was 12 by 12 feet, and not higher than 10 feet. It has been proved that the mill hands spend more money on liquor than on food or clothing. Only a very small percentage of the work people can read, and even in Bombay only 25 per cent. of the children attend primary schools.

I have been assured by many managers and assistant managers, who have worked both in England and India, that it takes five or six men to do the work usually performed by one Lancashire operative. Workers are searched before leaving the mill, and I have been told it is not rare for brass fittings to disappear from the mill in an inexplicable manner. The moral tone of the workers generally leaves much to be desired.

COTTON WAITING TO BE GINNED AT RAJNANDGAON, INDIA.

The wages of the operatives are, in most cases, paid monthly, and it is the practice of the mill owner to keep one month's wages in hand. The operatives come to the mills only from necessity, and have no money when they begin work; they are therefore forced to apply to a money lender for two months' keep. As the money lenders make very high charges, the operatives hardly ever get out of their clutches. It hardly need be added that money lenders have become quite a numerous community. The average wages of a weaver are 24s. to 26s. ($6.00 to $6.50) per month; the wages are calculated on the weight of cloth produced, irrespective of the pick or reed.

Every mill is obliged by law to keep four holidays per month, and at the beginning of each month the Factory Inspector must be informed of the dates on which the mill will be standing. The usual working hours of an Indian mill are at pres-

cent 13, but some work longer, others only 10 hours. It is anticipated that a new Factory Act will shortly come into force regulating the working hours to 12 per day. I was assured that the production of a mill in India is only 65 to 66 per cent. of that of an English mill, although many more operatives are engaged. As an example, I was told of one mill of 3,000 looms in which there are only six men able to attend to three looms each. The remainder attend only to two looms each. Small children are allowed to accompany their parents into the mill. Children begin work as "half-timers" when they are nine years old; a boy of nine years is able to earn eight to nine shillings per month. The careless manner in which the operatives work the machines necessitates their being built specially strong, and the extra amount spent in mill stores owing to careless in very considerable.

COTTON GROWING.

I have made it a point to ask every mill owner and the government agricultural officers I met, whether they thought an extensive development of the cultivation of cotton in India could be obtained. In every case I have been told that the possibilities in India are enormous; that within a few years' time—say, four to five years—India might produce quite as much cotton as the United States grows now.

As regards the use of Indian cotton, a prejudice seems to exist, especially among the Lancashire spinners, due to former unfavorable experiences. Conditions have changed within the last 10 to 15 years, and the fact that some of the Indian cotton mills produce 40s yarn regularly from Indian cotton proves that it could frequently replace American cotton. East Indian cottons are better known on the Continent and in Japan than in Lancashire.

Many experts assured me that India could produce, within four or five years, 10,000,000 bales of cotton if the matter were properly dealt with; such a quantity would, of course, have a powerful influence in checking American speculation. Some of the cotton spinners in India maintain that the present acreage under cotton alone would suffice to produce a crop equal in size to that of the United States, if a more intense cultivation were generally introduced. There exist all the fundamental conditions for a supply on a commercial basis, viz., an excellent system of Government railways, which is constantly being enlarged, good country roads for transportation, a tremendous population accustomed to agricultural work from childhood, and an excellent Government Agricultural Department. The cotton plant is indigenous to India, and its fiber has been employed for the making of clothing for thousands of years. The fact that this year the crop has been estimated to be almost half as large as the American crop shows that cotton growing is an immensely valuable asset in the country's commercial system.

The quality of cotton was, some 20 years ago, of a superior character to that produced, say five years ago, as has been repeatedly stated by users of Indian cotton at the International Cotton Congresses. During the last few years efforts have been made by the Government Agricultural Department to improve the quality, and the result has been very satisfactory. The Indian farmer in most districts recognizes the value of this Government department, and is willing to adopt the advice given by the Government officials. The Department of Agriculture in India is doing excellent work, on a scientific basis, for the promotion of cotton growing, but what is now wanted is the more extensive and practical cooperation of the actual users of cotton, and in this connection the International Federation can be of great service. By seed selection the Directors of Agriculture have developed long-staple indigenous cotton, and in some parts of India American seed has become acclimatized, yields well, and has maintained its characteristics for several years. It is important to note, however, that greater success has been achieved by improving the character of the indigenous kinds than by the introduction of exotic. American seed appears to flourish in a few districts only, and Egyptian seed seems to be capable of development to some extent in Sind.

One great difficulty in persuading the farmer to grow long-staple cotton arises from his inability to obtain adequate remuneration for the extra time and care involved in its production. Then, again, the yield per acre is smaller than from short staple plants. The establishment of cotton buying agencies (such as the agencies of the British Cotton Growing Association in Africa) in a few of the more important cotton producing centers would tend to the removal of this difficulty, and would result in a great increase in the cultivation of long-staple cotton. It seems that through prejudice many spinners have not used Indian cotton of late years, and that they are also unaware that good staple Indian cotton is grown.

In considering the question of cotton growing, one must regard it from an international, not a national, point of view. Even if the cotton crop which India will produce within the next few years does not supply a very large number of English mills with long-staple cotton, one must remember that the European Continent, India, and Japan will be replacing American cotton by East Indian cotton more and more. A corresponding quantity of American cotton will thus be left over for the use of the English spinners. Under any circumstances, therefore, it will be advantageous to the English spinner to encourage the development of cotton growing in India, and this view should be emphasized in approaching the Government of India. It is hoped that some of the additional capital which the British Cotton Growing Association is now obtaining will be used in developing the great resources of India as a cotton-growing country.

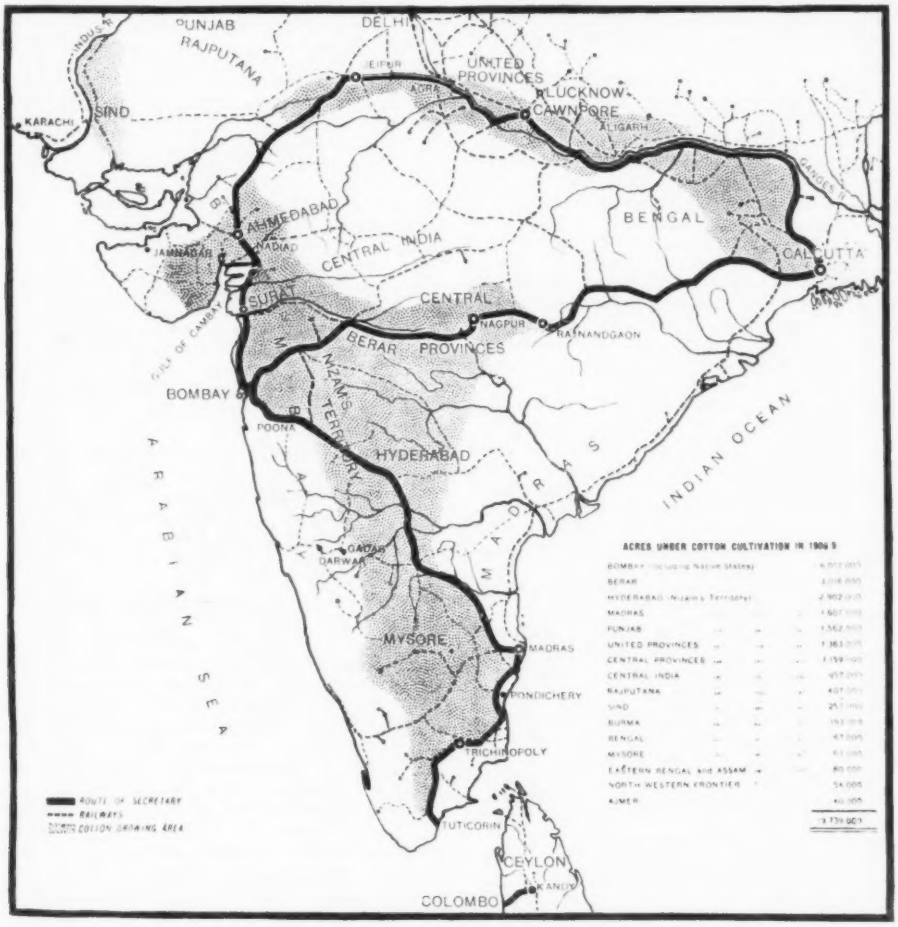
The experiments which are being carried on in Africa are necessary preliminaries to the development of cotton growing in that country, and no one interested in the cotton industry would like to see the splendid efforts made by the British Cotton Growing Association in that part of the world relaxed; but it must be admitted by even the most sanguine that for some time at least the African crop will be a negligible quantity compared with the American and Indian crops, as in Africa many of the fundamental conditions, such as the construction of railways, the teaching of the natives,

the scientific study of cultivation, etc., have to be introduced, while they are already in existence in India.

Some Manchester people have in former years declared themselves opposed to an extension of cotton growing in India on the ground that an extension of the spinning industry in that country would inevitably follow, and that industrial competition would thus be made keener. If one admits the truth of this argument as regards India, it should apply with equal force to America. It must be borne in mind that an extended cultivation of cotton in India would lead to an increase in the spending power of many millions of natives who are the largest consumers of English and Indian cotton manufactures.

The Director of Agriculture at Nagpur stated in his interview with me that in 1910 his various seed farms would be self-supporting. I see, therefore, no reason why many more seed farms should not be established by the Government in other districts, as the outlay of money would be comparatively small under proper management. In order to make the small farmer independent of the money lender, who to a great extent dictates to him at present what kinds of crops he should grow, the Government should be requested also to promote the extension of agricultural banks. In many native States there is an export duty on cotton. The selling price of this cotton cannot, as a consequence, compare favorably with the prices of cotton grown outside those native States. The tax acts as a check upon the expansion of cotton growing, and its abolition would undoubtedly stimulate the development of that industry.

Not only is Indian cotton available for the European and Asiatic cotton industries, but a shipment of 10,000 bales has recently been made from Bombay to the United States of America. The increase of 1 1/4 to 1 1/2 million bales in the present East Indian cotton crop is a most important factor at a time when other cotton crops are de-



MAP OF INDIA, SHOWING COTTON GROWING DISTRICTS AND ROUTE OF SECRETARY.

ficient. I think I am justified in saying, as regards Indian cotton, that in the near future we have prospect of a great increase in quantity, and of a marked improvement in quality.

I venture, therefore, to summarize the improvements which, in my opinion, would be highly beneficial and would promote the expansion of cotton growing in India:

(1) Establishing of cotton buying agencies in the long staple growing districts, similar to those in Africa.

(2) Cooperation of the cotton millowners of the world with the Government Agricultural Department.

(3) Establishment of a greater number of cotton seed farms.

(4) More rapid extension of the agricultural banks.

(5) Abolition of the export duty on cotton grown in the native States.

Extended sympathy on the part of the Government of India, and more effective co-operation by the cotton spinners of the world, will help forward cotton growing immensely, but I am afraid that without these supports, instead of growing cotton the farmers will take up and develop other produce.

Most of the Indian cotton is grown in the Bombay Presidency. I paid an extensive visit to the most important Government cotton farm in this large Presidency, viz., Athwa, near Surat. The superintendent, Mr. C. S. Patel, and the cotton supervisor, Mr. K. D. Kulkarni, are both very enthusiastic about cotton growing, and have obtained a theoretical and practical knowledge at one of the many Indian Agricultural Colleges, and are doing excellent work in the district. I was first shown over several plots planted with tree cotton of various kinds. The trees were planted 6 feet apart from all sides, and looked in a very poor state, owing to insect pests. Some of the bolls were open, but hardly any were perfect.

I was told that tree cotton in the Surat district had proved a distinct failure, as it harbors the insects more than the herbaceous plants, affording a hiding place for them in the rainy season and in winter. The trees require a great deal of space, and nothing can be grown between the rows after the first year. The trees were planted five years ago; they were about 7 feet high, and the branches of the trees seemed to touch those of the surrounding trees. Experiments with tree cotton are still being continued, although there is very little hope of success. In this connection, I may mention that tree cotton seems to be considered a general failure in India.

The British Cotton Growing Association, in cooperation with Messrs. Shaw, Wallace & Co., undertook some experiments in Maniapur in 1905-6, and in Mourbhanj (Orissa) in 1907-8, which have been abandoned, and in the July number of 1908 of the Agricultural Journal of India, it is stated that the claims of Dr. Thomatis with regard to his "'Caravonica' cotton have not proved correct in India, where it has been found delicate and a notoriously poor yielder, of poor germination, and of stunted growth. The only plant which survived was too brittle to retain its branches even in a sheltered position. All the plants were severely attacked by insects. The very nature of tree cotton is that it belongs to the woods of sheltered localities; its brittle nature forbids its being grown in open fields. The naked seeds are easily infected by insects. There is no full crop until the second year, and consequently the characteristics of absolute failure from climatic causes are carried from year to year, and the yield is never commensurate with the area which the tree occupies."

GINNING.

In Agra I obtained the following information regarding ginning. The gins stop in wet weather, as the knives slip the cotton when it is damp. At present seed of various districts and various qualities is collected in a trough at the back of the gin, and this accounts for the mixed character of some of the Indian cotton which comes to Europe, and for the deterioration which has been going on for many years. This is a very serious matter, and one for which a remedy is hard to devise. In Agra the ginning factories have formed a trust which has worked satisfactorily during the last two years. The charge for ginning is 7 annas (14 cents) per maund of 82 lbs., and it is estimated that the actual cost of ginning is 3 annas 9 pies (7 1/2 cents) per maund. An agreement has been entered into by which the ginning factory pays the profit, i. e., 3 annas 3 pies, into a pool, and at the end of the season this is distributed among the ginning factories pro rata to the number of gins worked in one season.

Cotton in the Agra district is generally cultivated in plots of 5 to 10 acres by small farmers who sell their production to a Bipari or Bannia, who is a kind of money lender. The Bipari advances money to the farmer, and often dictates to him what crops he must grow. The Bipari buys the cotton from the farmer, and sells it to a commission agent, who himself has frequently advanced money to the Bipari. The usual commission of this agent is 7 1/2 per cent. plus storage charges. Such a commission agent represents several Biparis from various districts, and it is in his godown or cotton store that the cotton of various qualities from different districts gets mixed. When the cotton arrives at the gin it becomes still further mixed. It is regrettable that the cotton has to pass through so many hands.

On my way back to Bombay I stayed at Rajnandgaon, Central Provinces. I inspected there a ginning factory of Messrs. Shaw, Wallace & Co., and the accompanying illustration shows huge cotton stacks, holding about 100,000 lbs. seed cotton. The cotton is stacked in order to facilitate protection from the rails. There were a great many cotton carts which I was told had come very long distances, one from a place 200 miles away. Most of them had come 100 miles, progress being at the rate of 15 miles per day. For the purpose of packing the cotton into the carts dry twigs were pushed between the bamboo sides in order to prevent the cotton from falling through. A good deal of cotton must be lost on the way, and the rains, which are frequent at this time of the year in the Central Provinces, spoil the cotton exposed in the carts. Evidently there are not sufficient ginning

factories in the country. On enquiry I learned that the following were in existence in 1906:

Bombay	261
Central Provinces and Berar	315
United Provinces and Oudh	97
Punjab	165
Madras	18
Burma	2
North-West Frontier	1
Total	859

In the United States, for slightly more than double the quantity to be ginned, there were at the same period 28,500 ginneries.

The twigs used for piling up the cotton in the carts cause a good deal of impurity in the lint. Women are employed almost exclusively in the ginning factories; they receive 2 annas (4 cents) per day, while a few men employed outside get 3 annas (6 cents) per day. The ginneries are worked day and night. I am told that the farmers in this district, especially in Nagpur, gin the cotton by hand which they intend to plant the following year, and this process is generally carried out shortly before planting.

Rajnandgaon is situated on the outskirts of the Central Provinces cotton-growing district. The staple of cotton grown here is only short. The cotton, however, is white and elastic. As cotton absorbs a great deal of nitrogen, and as a kind of pea called "Raha" gives nitrogen to the soil, it is the custom all over the Central Provinces to plant 8 or 10 rows of cotton and then one of "Raha." I have noticed from the railway that this method has been almost universally adopted in the Central Provinces, which is no doubt due to the efforts of the Agricultural Department.

DAMP IN COTTON.

During my visit my attention was drawn to damp in cotton, especially in that coming from the Central Provinces, and I was told that there is only one cotton ginning factory in that district which does not artificially damp cotton when baling. No secret is made about this damping, as special rates are quoted for dry and wet packing. Reference to this evil was made by Mr. S. M. Johnson, of Cawnport, at the Bremen Congress.

METHOD OF OBTAINING THE FIGURES OF THE COTTON CROP.

On inquiring about the method adopted for obtaining the figures relating to the total crop of cotton in India, I was informed that every village had a map on which the various crops are noted every year. This map is kept by a village recorder, watchman, or accountant, and is sent periodically to the Commercial Intelligence Bureau in Calcutta. The ascertained production of a selected plot of one-fifth or one-tenth of an acre in each district is taken as an average crop, and the estimated acreage in each district, as marked in the map, is multiplied by the quantity thus obtained. I have discussed this system with many experts, and they all agree that the result is a mere guess. The difference between the figure obtained in this way and the real facts may, according to the opinion of those who compile them, vary from 20 to 25 per cent. Generally the figures of the Commercial Intelligence Bureau are too low.

I have suggested to the various officials that the same system of ginners' reports as is in operation in the United States of America should be introduced into India. In making this proposal I recognize the fact that about 20 to 25 per cent. of the Indian cotton crop is hand ginned, but by introducing fortnightly ginners' returns the spinners would have 75 to 80 per cent. of actual facts, and the remaining 20 to 25 per cent. could be estimated in the same manner as is done now. It must also be remembered that ginning by hand is dying out, and that it will take a few years before such a new system is working satisfactorily all over India, especially as it would require some legislation to force the ginning factories to make returns. The largest extent of hand ginning is found in the Madras Presidency.

It is hoped that in a few years' time the Indian crop will be much larger than it is at present, and it will be then even more important than now to have a better system of estimating the crop. I discussed the proposed Ginners' Returns with all the Directors and Deputy Directors of Agriculture as well as with the mill owners with whom I came in contact, and they all agreed that the introduction of ginners' returns is feasible, and would be of great benefit to all concerned. Some of the Directors of Agriculture showed a willingness to take the necessary steps to introduce this reform at once, but I suggested that a resolution at the next International Cotton Congress would be the proper means to adopt in order to present these views to the Indian Government. As for the system of ginners' reports in use in America, a reference to a paper read by Mr. D. C. Roper at the International Congress at Vienna will give the necessary information.

There are now 10,902,217 spindles in use in the cotton mills of Germany, an increase of 1,172,002 since 1905. During the same period there has been an increase of 29,124 looms, the number in use now being 260,323.

Of the imports of cotton into Great Britain during the year 1908, about 77 per cent. was contributed by the United States, 17 per cent. by Egypt, and 3 per cent. by British India.

In 1908 Germany imported 1,980,274 bales of cotton and exported 222,606 bales. During this year the value of imports and exports of cotton goods was $46,037,292 and $104,945,862, respectively.

THE WOOL INDUSTRY OF VICTORIA, AUSTRALIA.

A Report from Consul General John F. Jewell, Melbourne, Australia.

The total area of the State of Victoria is about 87,884 square miles, or 56,245,760 acres, of which about 30,000,000 acres are devoted to cattle and sheep. The first official return of sheep in the State was in 1836 when the number was 41,332, which has since increased to 14,000,000. The first sheep were received from the flocks of the States of Tasmania and New South Wales, the descendants of those originally brought from England in the early settlement days of Australia. The following table shows the number of sheep shorn in the State and the quantity of wool produced during the past five seasons, viz:

Season of	Sheep Shorn. No.	Wool Produced. lbs.
1905-6	11,517,490	75,783,303
1906-7	12,794,043	88,434,296
1907-8	14,331,107	93,082,341
1908-9	12,639,800	87,536,451
1909-10	*14,250,000	*95,000,000

*Estimated—actual figures not available.

The wool produced includes, with the quantity shorn, an estimate of the quantity taken from skins and upon skins shipped from the State. The average weight of the fleece in the 1908-9 season was: sheep, 5.98 pounds; lambs, 2.11 pounds, and sheep and lambs combined, 5.45 pounds. The average number of sheep in a flock in the whole State in 1908 was 642, and the following table issued by the Government Statist classified the sheep of the State according to sizes and number of flocks, viz:

Sizes of Flocks.	Number of Flocks.	Number of Sheep.
1 to 500	15,797	2,415,541
501 to 1,000	3,414	2,393,866
1,001 to 2,000	1,490	2,130,673
2,001 to 3,000	411	1,007,456
3,001 to 5,000	288	1,139,661
5,001 to 7,000	114	679,493
7,001 to 10,000	100	864,734
10,001 to 15,000	79	989,913
15,001 to 20,000	39	684,469
Over 20,000	52	1,672,158
	21,784	13,977,964

Flocks of under 500 formed 72.52 per cent. of the total; those of from 500 to 1,000, 15.67 per cent.; from 1,001 to 2,000, 6.84 per cent.; from 2,001 to 3,000, 1.89 per cent.; from 3,001 to 5,000, 1.32 per cent., and larger flocks much less. The State is generally believed to have reached its full carrying capacity in sheep and a further increase in either the number of sheep or amount of wool produced is not to be expected, but on the contrary, owing to the "Closer Settlement" policy of the Government in purchasing large areas of land from private owners formerly devoted to sheep grazing, and subdividing into small holdings of from 100 to 300 acres for sale to farmers for agricultural purposes, the area available for the wool industry is likely to decrease considerably. The preceding table of flocks will show that there are now in the State few flocks of 20,000 sheep as the result of this policy, and the general tendency is towards smaller holdings as the population increases.

Wools from the finest merino to coarse wool from British breeds, such as Lincolns, Shropshires and Leicesters, and from the various crosses between the long wool breeds and the merino, are produced in Victoria, the proportion of merino to the total clip being about 40 per cent., varying from super sixties to eighties and over. About 50 per cent. is crossbred, of which 25 per cent. is of fine (over fifties) quality, 15 per cent. medium and 10 per cent. coarse. The best clips of the State in quality are said to come from flocks of over 5,000 sheep, and which have been carefully guarded in purity of strain. The quality of the wools of the State are said to be amongst the best produced in any part of the world, and while practically the whole clip is suitable for American requirements, only the lightest and cleanest wools of high yielding and spinning properties are purchased by our manufacturers, owing to freight and tariff conditions.

During the year 1908, Great Britain purchased wool in the State to the value of $15,912,962; France, $6,475,924; Germany, $2,170,087; Belgium, $472,044 and the United States, $4,200,000. As the sales of the present year are closing it is evident that the purchases of the United States in 1909 will be nearly 25 per cent. more than

in 1908, and will probably constitute the record quantity bought in the State in any one year for that country. The local manufacturers of woolen goods in the State are as yet in their infancy, about 6,000,000 pounds weight of wool being consumed annually by the two or three mills and felt hat factories established, and a ready market is found within the State for the whole of their output. As these industries, especially in the making of flannels, blankets and tweeds, of which about $15,000,000 worth is imported each year from Great Britain, show every indication of great activity in the near future it would appear that the State is more than likely to become a much larger consumer of her own raw product than at present.

Most of the shearing is now done by machines, of which there are many makes upon the market, principal ones being driven by steam and oil engines, with one or two by electricity. On the smaller ranches or "stations," as they are termed here, and by farmers running a few sheep in conjunction with agriculture, hand shears of the ordinary type are still used. As the fleeces are shorn in the shearing sheds they are thrown upon a table, skirted, rolled and classified by an expert classer, and the skirtings picked and graded, all the wool including broken fleeces, pieces, etc., being dealt with in that manner. The quantity of the wool pulled from the skins of dead sheep is infinitesimal, most of the skins being shipped to Great Britain in the wool, but those treated here are generally fellmongered by ordinary methods and the wool scoured and shipped to the same destination.

The wool is, when classed and sorted, made up in the sheds into bales averaging 340 pounds in weight and 4 feet by 2 feet 5 inches, the pack being of jute and imported from India. These bales are afterwards compressed by hydraulic and other pressure to one-half the original size and secured by steel bands in order to economize space in transportation to London, Boston, Hamburg and other ports. The wool growers of the State, of which there are about 16,000, have been well instructed in the market preparation of their wools by the literature and traveling representatives of the many large wool brokerage companies of Melbourne, to whom practically the whole of the clip is consigned for sale. As a result of this educational policy very few of the clips, even of the small growers who produce too small a quantity to employ a classer, are presented for sale in a faulty condition. Many small growers, however, consign their wool to the selling brokers in whose splendidly appointed warehouses provision is made for such classing, pressing, branding and other market preparation at a moderate cost.

Generally speaking the methods in vogue in the State of shearing, classing and handling wool are of a very high standard. Wool classers, who usually learn their work in the warehouse of, or upon a ranch owned or controlled by one of the large brokerage companies, are paid at the rate of £1.0.0 ($4.86) to £1.10.0 ($7.29) per 1,000 sheep and lambs. Shearers, who receive £1.2.6 ($5.46) per 100 sheep and lambs shorn, together with food and lodging, are exceedingly well remunerated, as a good one will easily average 100 sheep a day with the machine shears now so generally used. The salary of a ranch manager ranges from £200 ($973.00) to £500 ($2,433.00) per year, the average being about £250 ($1,216.00). Piece pickers and wool rollers are paid £1.7.6 ($6.68), and ordinary ranch hands from £1.5.0 ($6.07) to £1.10.0 ($7.29) per week and, as in the case of managers, classers and shearers, also with food and lodging.

When the wool has been classed, sorted, baled and branded it is forwarded from the ranch to one of the warehouses of the many brokerage companies in Melbourne, the principal wool market of the State, where about four-fifths of the clip is sold, and is there catalogued for sale and 10 per cent. displayed as samples in well lighted and appointed show rooms some days before it is sold in order that intending buyers may

have ample time and opportunity to inspect and value it before the actual sale takes place. Catalogues giving brands, description and quantity of each to be sold are issued by the company controlling the warehouse in which the wool has been stored, the sale itself taking place in a wool auction room established in a central position by an association of these companies and in which every convenience is provided in the way of desks, etc., for the buyers who attend these sales from all parts of the world.

The sales, which are held at intervals during the season according to the wool available, are solely by auction, the wool going to the highest bidder, and are arranged by the various companies so that no two sales take place at the same time. Each company provides its own auctioneer, who is usually a salaried employe. These auctioneers make no comments whatever on the quality of the wool offered by the buyers, who have been given every facility for inspecting and valuing the brand and lots to be sold prior to the sale, are supposed to be fully informed on the subject, with the result that to the uninitiated the sales are conducted with bewildering rapidity. Ninety per cent. of the wool clip of the State is disposed of in this manner, together with almost as much again from certain parts of the adjacent States of New South Wales and South Australia and from Tasmania, which it is found more advantageous to sell in Melbourne. The wool is practically all sold in the grease at these sales and exported in the same condition, not 5 per cent. of the clip being scoured in the State.

The principal conditions of sale are that the wool must be taken away from the warehouse within fourteen days from the date of the sale at the buyer's expense and paid for in cash or approved draft before removal, during which fourteen days the wool is protected by the seller against loss or damage by fire. The buyer must pay the broker one-eighth of one penny (1/4 cent) per pound for warehousing and delivery, with the following exceptions: (a) wool realizing 3 1/2d (7 cents) or under per pound 1s 6 d (36 cents per bale; (b) fadges, 1s (24 cents) each; (c) sacks, 4d (8 cents) each. The buyer is allowed during six days after the sale every reasonable facility for the examination of the bulk of the wool he has purchased from the samples displayed previous to the sale, and if a dispute arises it may be referred to arbitration, but the selling arrangements are so well made that this seldom occurs. No advance in bidding at sales of less than one farthing (1/2 cent) per pound is received.

Immediately after the sale has taken place a price catalogue is issued by the company holding the sale, in which the various lots of wool sold with their brands and prices obtained are given for the information of interested persons. These companies look after the interests of the grower from the time the wool is consigned to them until the price has been received from the buyer when the charges for their services are deducted and the balance remitted. The charges, which are uniform among the companies, are as follows: For receiving, weighing, warehousing, lotting, repacking, fire insurance, sale expenses, etc.,—one-eighth of one penny (1/4 cent) per pound. Commission on sale—2 1/2 per cent. if under £200 ($973.00); 1 1/2 per cent. from £200 to £500 ($2,433.00), and 1 1/4 per cent. on £500 and over. When wool is offered for sale, but not sold, one shilling (24 cents) per bale (340 pounds) is charged, which includes warehousing, insurance while in the store, receiving and delivery.

Wool growing in Victoria is a very profitable industry, the ranch owners or "squatters" as they are termed here, being the wealthiest class in the community. Most of the land held by them is very rich and was obtained by grants from the Government, or at very small cost, in the early days of the State and is now being bought back by the Government in some cases at $150.00 to $200.00 per acre for the purpose of cutting it up into small blocks for sale to farmers on easy terms for wheat growing. High prices for wool have been obtained for some years and during the present season (1909-

10) the great bulk of the good wools are bringing from 10 1/2d (21 cents) to 12 1/2d (25 cents) per pound, while the staples next in quality are selling freely from 13 1/2d (27 cents) to 15 1/2d (31 cents) and upwards, a considerable quantity realizing from 19d (38 cents) to 20d (40 cents) and some extra super merino lambs as high as 23 1/2d (47 cents) per pound.

With such prices in a ready market in close proximity and reached at small expense in comparison, there can be no doubt as to the profitable nature of the net returns received by the growers. In prosperous times such as these very few of the growers require to be financed. If an advance against his wool is desired by a grower it is easily obtainable by giving a bill of sale over his sheep and an undertaking to sell his wool through the company, making the advance, the usual rate of interest being 6 per cent. per annum. Some of these companies and the ordinary banks advance against the land as well as the stock owned by a grower, in which case both the deeds of the land and a mortgage over land and stock are held as security, the rate of interest seldom being higher than 5 or 6 per cent.

Apart from dry seasons, which are occasionally experienced in parts of the State, and which at times seriously curtail the returns of some of the growers, the greatest trouble they have to contend with is the rabbit pest. These small animals were originally introduced from England about sixty years ago for hunting purposes, and, finding their environment congenial, multiplied at an alarming rate. Many fine estates were for a time rendered almost valueless owing to their depredations and both the Government and private owners spent large sums in endeavoring to eradicate the pest. Of late years, however, they have been kept well in check by netting in the land affected with wire netting of a 1 1/4-inch mesh, destroying all harbors, and by digging out the burrows, the rabbits being killed off during the process by packs of dogs of various breeds.

In rocky country or along river banks, the burrows are often blown up with explosives with good effect, and in other cases the burrows are hermetically sealed, the fumes of sulphur and carbon pumped into them and the rabbits suffocated. A large factor in the prevention of the too rapid increase of rabbits is the commercial value they have attained of late years, as the Australian variety is very edible and a nourishing food.

Large quantities are exported to Great Britain in a frozen condition, and the skins meet with a ready sale at good prices to hat and glove manufacturers in Great Britain, United States, Itady, France, Belgium and other countries, the United States alone taking about $400,000 worth annually from this State.

IMPERIAL VALLEY COTTON.

BY W. H. KINDIG.

From the Los Angeles (Cal.) Herald.

The people of California are to be congratulated upon the achievement of the Imperial valley cotton growers in making such a financial success of their first commercial crop of cotton. Not since the discovery of oil has there been an event which promises so much for the industrial development of Southern California.

For some years desultory experiments have been made with the growing of a few plants of cotton here and there, but it was not until the past year, 1909, that it was tried commercially. Early in the year Joseph R. Loftus, president of the American Nile Cotton company, brought from the south a carload of cotton seed of the Mebane Triumph variety, and some of the Sims Improved from Georgia. This was distributed to about forty ranchers of the valley under a guarantee that their crop would be ginned if it proved successful.

Some who had applied for seed became discouraged by the pessimistic talk of friends and fed the seed to cattle instead of planting. Some others planted the seed, but neglected it after it had sprouted, allowing it to go without irrigation while they turned their attention to cantaloupes. But those who attended to their cotton crop to the best of their ability had ample reward for their pains. The result reached the expectations of the most sanguine. The crop was practi-

cally an experiment. The growers did not know the best time for planting, nor the best times for irrigating, nor the proper amount of water to use, and yet without this knowledge they harvested from one bale to a bale and a half per acre. The stalks grew from three to four feet high, carried from 100 to 150 bolls and produced a beautiful snow-white silky fiber.

opera house in that city, where enthusiasm took the place of solicitude.

The first cotton picked in the valley was brought in by W. A. McClannahan from the Wilsie ranch. This was made into a bale and purchased by Mr. Fuller, and is being kept as a permanent exhibit in the El Centro national bank. The first cotton to actually go through the gin was from the Joseph

THE FIRST TRUCKLOAD OF GOODS MADE FROM IMPERIAL VALLEY COTTON.

The planting was done about the first of May, and the growing crop was irrigated four or five times during the season. The picking was begun in September. The machinery for a gin was not ordered until about September 1, as it was necessary to be assured of a crop before going to that expense, but contracts were let and the machinery got in place, electric power was obtained and a plant consisting of two 70-saw gins started on October 18 at El Centro. This was followed by a notable demonstration at the

R. Loftus Co.'s Meloland ranch, and the bale made from this cotton forms a part of the Imperial valley exhibit in the chamber of commerce at Los Angeles.

The first carload of cotton was purchased by the California cotton mills, at Oakland, and made up into various kinds of towels and tablecloths, each piece being stamped "Manufactured from the first cotton grown in Imperial valley, crop 1909," and were placed on sale in Los Angeles on January 2, 1910. There were about 600 bales of 500 pounds

each actually ginned and marketed, and the manufacturers to whom samples were sent early in the season were not slow in making bids for the entire crop.

The fiber of this cotton is stronger than that of similar varieties grown in the south. The spinners report that it will spin a thread 30 per cent finer than the usual product. In addition to this, it is uniformly white, without the stain and soiled condition which is characteristic of much southern cotton.

Imperial valley possesses four distinct advantages over other sections in producing cotton; or, rather, the four great disadvantages to cotton growing are eliminated in this section. Imperial valley will have no drouth, which is one of the great troubles incident to cotton raising. There is abundant water ready at all times. The valley has no excessive and destructive rainfall which stains the bolls, knocks them out of the locks, and drives them into the sand and dirt. Frost does not come early enough to retard the ripening of any of the bolls. They continue to ripen until practically every one is in full bloom before there is any danger whatever from frost.

Imperial valley has no boll weevil, and will have none, because the atmosphere is so dry that it will not allow its propagation. This same thing is true of other insect pests, such as fleas, and the scale which infests orange trees.

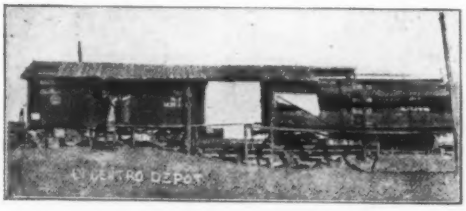
The result is manifold. With the extremely fertile soil, abundant water and unequalled climate, not only will this section produce an immense yield, but it will produce this yield every year without any danger of failure.

The crop the past year, from one bale to a bale and a half per acre, was obtained under disadvantages already cited, and with newly imported seed. It has been shown to be a fact through repeated experiments that cotton seed will produce more abundantly when acclimated than when newly brought in, so the growers expect to reach a yield of two bales per acre next year.

Plans have been made, and seed purchased to an extent that indicates the planting of 30,000 acres the coming season of 1910. A movement is now on foot for the growers themselves to organize a company for the manufacture of cotton seed oil and its by-products. Private capital would not be lacking to do this, but the growers feel that if they can add to their earnings by doing their own manufacturing to this extent, they should do it and keep as much of the profits as possible in the valley. At a recent meeting of the cotton growers the first steps were taken toward the incorporation of a company for this purpose, and a plan was presented by Mr. Srack, by which a mill could be built with a capacity of 50 tons of seed daily, if the growers would subscribe for stock to the amount of seed which they will have to market from the next season's crop, basing his estimate upon the amount of acreage for the planting of which seed has already been purchased.

COTTON FIELD ON J. R. LOFTUS RANCH AT MELOLAND, FIVE MILES EAST OF EL CENTRO.

Another question which will soon be raised will be that of cotton mills for the manufacture of cotton fabrics. The only cotton mills on this coast are located at Oakland under the name of the California Cotton Mills Company, and it is this concern which absorbed most of the output of the valley up to date. Ten thousand bales of cotton is sufficient to keep an average mill running throughout the year, and as the next crop will be approximately 40,000 bales, it is not to be supposed that Los Angeles enterprise will allow all of that raw material



EL CENTRO DEPOT IN 1906.

EL CENTRO DEPOT IN 1909.

to go out of the country when it could be manufactured here just as well.

One thing that claimed the solicitude of the prospective grower last year was the question of labor, but that seems to have been met satisfactorily. At the price paid for picking, $1 per 100 pounds, and the ability of a good picker to bring in 300 or 400 pounds a day, the earnings were sufficiently large to attract white help. A great many white families from the south offered their services, but the crop was not large enough to justify their moving to the valley last year. Another year will see a large influx of this class of people. Then too, there is an abundance of Mexican labor to be obtained locally, which is both efficient and cheap.

The amount of money brought into the valley from the first crop amounted to about $50,000. The price of cotton was somewhat above the average on account of the shortage in other parts of the world. With the expected crop for next season, even at an average price per bale much lower than that received the past season, the receipts should approach the $2,000,000 mark. The Cotton Growers' association has compiled figures from reports sent in by individual growers showing the actual cost of production and the net profits received. It requires only twenty pounds of seed to plant an acre. This can be purchased at 50 cents to $1 for each acre, and added to the cost of preparing the ground and cost of cultivating and irrigation water, the report shows an average cost of $9 per acre up to the time of picking.

Pickers were paid $1 per 100 pounds. Fifteen hundred pounds has to be picked to produce a 500-pound bale of cotton, leaving 1,000 pounds of seed. Hence the cost of picking is $15 a bale. Five dollars a bale is charged for ginning, making a total cost where the yield was one bale to the acre of slightly less than $30 per bale. During most of the season the cotton was marketed right from the gin at 14 cents a pound, or $70 a bale. Adding to this the value of 1,000 pounds of seed, which at a low estimate is worth $10, gives a revenue of $80, showing a net profit of $50 per acre. Some growers who operated on a small scale claimed to have done much better than this, and there is every reason to believe that average results will prove better than this next year.

All the above figures are based on the growing of an ordinary short staple cotton.

It has been shown by the experiments of individuals as well as the government experts that Egyptian, or long staple, cotton can be grown in the valley. In fact, several fields of one acre each have been grown the past season, but as the seed of this variety is more susceptible to climatic conditions, it is necessary to propagate the seed through two or three seasons before it is sufficiently acclimated to produce the best results.. Another year will see a considerable acreage planted to this variety for commercial purposes. It is a longer and much finer staple, and is used in the manufacture of thread

where it must be spun very fine and yet have sufficient length of staple to give a high degree of strength.

The demand for this quality of cotton always exceeds the supply, and the price continues at a high mark, irrespective of the fluctuations of the ordinary market. Such a cotton grown in the Imperial valley should bring at least 30 cents a pound, and easily double the net revenue of the growers.

New gins will have to be erected in various towns, cotton seed oil mills will be necessary, and an immense industry will be established. The financing of this amount of new business is now occupying the attention of those most interested. Considered financially, Imperial valley up to this time has had many difficulties. Every dollar that has been taken to the valley has been invested in the fight to make the desert bloom, and no idle money has gone to swell the deposits of the local banks in that section. So it has been difficult to borrow money with which to develop land and raise crops. Now that a staple crop like cotton can be produced, one which is imperishable and in constant demand, and on which warehouse receipts can be used as collateral security, outside money will be available for use in the growing of the crop.

At a meeting of the cotton growers of the valley at El Centro on February 2, Mr. Loftus of the Joseph R. Loftus Company announced that he had arranged with capitalists to place $500,000 at the disposal of his company to be loaned on the growing crop of cotton next season. Arrangements will be made to lend a planter an amount up to $10 an acre as soon as his cotton plants show above ground. This amount will be sufficient to care for his crop from the time of preparing the ground up to the time of picking, and will assist materially in the planting of a large acreage.

Thus with the advent into the valley of the energy, the pluck, the perseverance, the nerve to dare and the ability to do which characterizes the spirit of Southern California, the desert is made to blossom, the soil is made to yield up treasures, consumers the world over are benefited, and California has added one more to her already long list of staple products.

Cotton Growing in German Colonies.

Mr. Moritz Schanz, of Chemnitz, has published a paper on "Cotton Growing in German Colonies," which he read before the International Cotton Congress at Brussels in June. It is interesting in the suggestion of many points of similarity between the work done by our own Cotton Growing Association and by the Sub-Committee of the Colonial (Economic) Committee which devotes particular attention to the subject. Both these bodies are working for "the common welfare," and the causes which led to the German venture are precisely what have initiated our own. Like ourselves, the Germans are looking for countries which, by virtue of regular climate, cheap native labor, and cheap transport, should be suitable for cotton cultivation, and they, too, find these or the prospects of them particularly in Africa.

We are sometimes assured by American friends that we are all pursuing a vain quest, and when we compare the production of colonial cotton by Germany or Great Britain with our needs the disparity may breed contempt in the ill-informed. Germany has advanced from the start in 1901 to something over 3,000 bales of 550 pounds annually, and for purposes of discouragement it may be said that she uses some 1,800,000 bales.

But these beginnings are inevitably slow, and it takes years of experiments that are never final to choose the most suitable varieties of cotton for local conditions, and years of education to make competent farmers or even laborers of those who cannot, as they might in established industries, grow up in the cotton fields. The education of the farmer has been taken up with great vigor by the German organization both in Togoland and in German East Africa.

In Togo an experimental station and school has been established at which some hundred young natives are learning how to grow cotton, and these will presently return to their own districts, where, if expectations be fulfilled, they will become centers of enlightenment and of local initiative. Something of the same kind is being attempted in Eastern Africa, where the cotton is of finer quality than that grown in Togo, being actually equal on the average to fully grown fair Egyptian.

The need for supplements to the present supplies of Egyptian cotton has lately been emphasized by Mr. George Harwood in the House of Commons, and the British Cotton Growing Association is now considering the possibility of more rapid and larger developments in the Soudan. The latest annual report of the Association shows that the yield of Egyptian cotton per acre has been steadily declining. For the last three quinquennial periods ending with 1906-1910 the yield has been respectively 5.48, 4.67 and 4.09 cantars per feddan, and it is now clear that the crop being delivered is by far the worst of all in relation to the area under cultivation. Even those who assure us that the Southern States are indefinitely capable of supplying Middling Uplands for our needs may sympathize in the attempts to enlarge the area that grows the finer cottons, which are more and more required as the needs of civilization expand beyond the simple necessities.

The Manchester Guardian.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

PLAIN VELVETS.

BY GAUL.

(Translated from the French by the Editor of the Textile World Record.)

(Continued from July).

PLUSH WITH A BACKING.

In all the fabrics previously described the loop interlaces the filling so as to show on the back, consequently if the back is napped

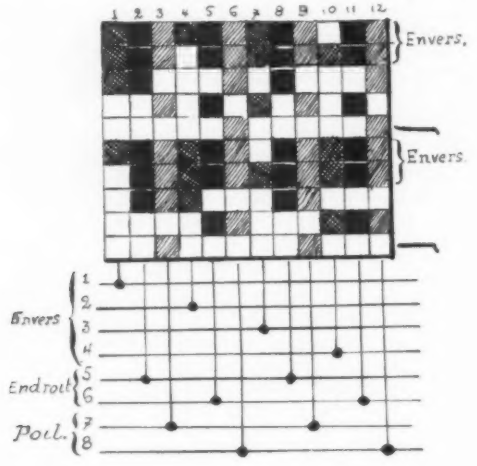


FIG. 35.

in order to make the fabric thicker and warmer there is danger of pulling out the loops or at least displacing them. Fig. 35 shows a plush fabric which can be napped on the back. As shown in the longitudinal profile, Fig. 36, and the cross section, Fig. 37, an extra set of warp and filling threads are added to form a back to the plush. This class of goods is especially suited for the manufacture of long cloaks. The following is a lay-out for a fabric of this kind: Width, 49 1/4 inches. Reed, 1,310 dents in 53 inches, 3 threads in a dent. Face warp, 2/70s black cotton. Back warp, 2/70s Black cotton. Pile warp, 2/30s mohair. Face filling, black carded woolen, 2 1/2 runs. Back filling, 24s worsted. Twenty rods to the inch. Rod 1/6 inch high.

FIG. 36.

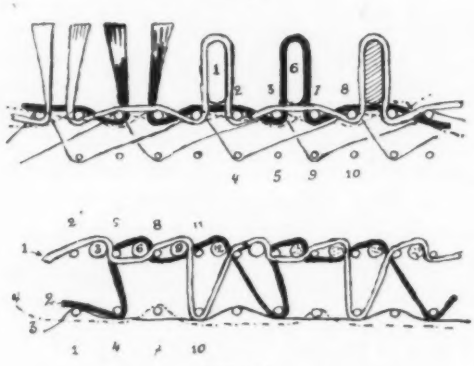


FIG. 37.

DOUBLE FACE PLUSH.

This class of plush, as its name indicates, has a pile on each side of the cloth. The

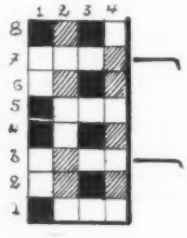


FIG. 38.

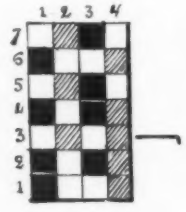


FIG. 41.

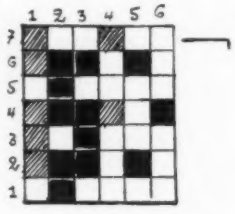


FIG. 44.

goods are used principally for tapestry hangings, obviating the necessity of doubling the cloth. Formerly these fabrics

were made by passing a rod alternately on the face and back. Now the rods are inserted in the face and the threads cut. Special filling threads are inserted between

FIG. 39.

the back pile and the ground work, allowing these pile threads to pass to the face.

Fig. 38 is a draft for this class of plush. The ground work is plain. The filling threads, 4 and 8, called "lost picks," inserted immediately after the rods, are generally coarser than the ground work.

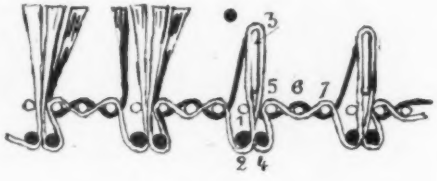


FIG. 42.

Fig. 39 is a longitudinal section of the fabric after the pile is cut. As shown at Fig. 40, each pile thread appears alternately on the face and back. Fig. 41 shows a draft

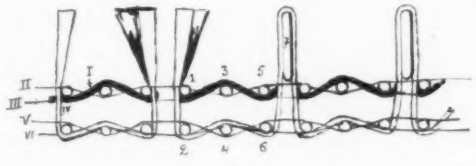


FIG. 45.

for a double plush which can be made with a face and back of different colors. Figs. 42 and 43 show a longitudinal section of the plush before cutting, after cutting, and after the lost picks, 2 and 4, have been removed.

Fig. 43 shows that each pile thread appears always on the same side of the cloth, consequently one set of pile threads may be used for the face and another set for the back, the two being of different colors.

FIG. 40.

DOUBLE PLUSH.

Two plush fabrics can be woven one above the other. Fig. 44 shows the weave for such a fabric. Fig. 45 being a longitudinal section. As is clearly shown at Fig. 45, the removal of the rod cuts the pile of both fabrics, that

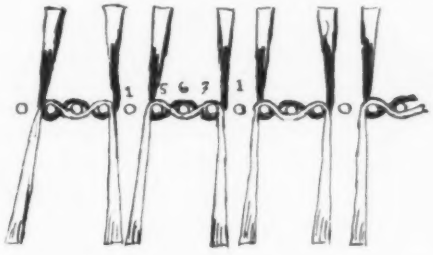


FIG. 43.

of the lower cloth passing through the upper fabric. In this way two plush fabrics are produced. They may be of the same or different textures. After cutting it is easy to separate the two. This method is used but little as the pile is not of the same height on the two cloths. The saving in labor is very small. Triple or quadruple plush fabrics can be woven on the same principle.

In conclusion we think it well to add that velvet fabrics woven with wire rods are meeting strong competition from velvets woven double and without rods. The looms for the last named class of goods are more easy to operate and give a larger production. The cloth is less regular and it is impossible to obtain the boucle effect. It is also impossible to obtain a very high pile.

ENGLISH NOTES.

By our Special Correspondent.

The curtain trade is particularly brisk in Nottingham, partly in consequence of good Canadian orders, but the lace business is dull. The Nottingham and Leicester knit goods factories have more than they can do to cope with current orders. The fashion for knitted three-quarter length coats for ladies has thrown a lot of work upon the machines, although some of these garments are being knit by hand in Ireland. In Ireland indignation is being manufactured by the tariff reform people about the free use made in the United States of the name "Balbriggan," which, it is held, is properly the exclusive right of the Irish firms in that village. Again there is an outcry against the "English Balbriggans" and "Nottingham Balbriggans" which are now commonly found in the English market, to the great distress of sentimental people who have no concern with knit goods and very little with Ireland. It is a question whether the English courts would register "Balbriggan" as a trade mark. On the ground that to the general public it did not denote a particular make of machine, the courts have declined to register "Gramophone" on the Gramophone Company's application.

* * *

In Ireland the linen business shows an enterprising tendency. The table linen firms have many new designs in progress and the sewing branch is being enlarged by the York-street Company's large new factory at Larne. The company has the intention of erecting in the same town a mill for fine spinning in competition with Sir Otto Jaffe's new undertaking. Belfast is still developing the mercerized cotton handkerchief trade. Printed in fast colors and good designs in imitation of silk, these Belfast and Manchester handkerchiefs are commanding large and profitable Continental orders as well as a good British business. The latter business is worth some investigation.

* * *

While these side lines of the British textile industry are flourishing the cotton spinning trade has taken another dive into the depths of depression. The worsted trade stands in need of a fillip or of a material reduction in price. The carded woolen branch is favored by dear worsteds and is as well off for work as could be desired. Cotton men wait expectantly for what October may bring and at the moment are making plans for organized short time again.

THREE-QUARTER LENGTH KNIT COATS.

Down wools of the new clip have kept up best of all English wools. This is attributed by dealers to the purchases of certain consumers. Like the rest of wools this season, they are well grown and in attractive condition and some manufacturers have bought heavily of them. The wools that Americans usually fancy for combing have gone 1 to 2 cents cheaper in the early country sales than they did last year. Dealers who buy in anticipation of American wants have received notice that first attention will be paid to the domestic clip. These dealers have not been anxious to load themselves with large quan-

tities. They are more inclined to buy at the reduced rates than at the initial prices of the season.

* * *

Local regulations as to mill whistles or buzzers vary in this country. Generally speaking they are forbidden in the textile cities and permitted in the outer areas where mills are fewer. The din of from one hundred to seven hundred hooters would be intolerable and there are mill towns in which manufacturers have arrived at a compromise. It has been agreed that certain mills shall sound their sirens and that these shall serve for the whole town. The buzzer serves as a fire alarm in supplement to the telephone and sprinkler bell. A mill signal that is not often heard in these days of watchman's patent clocks still survives in odd places. At nine, nightly, there is a loud report. It is the night man's blunderbuss giving notice to all and sundry that he is on duty and armed.

* * *

The Broad Oaks Printworks (formerly Grafton's), a branch of the Calico Printers' Association, has been the scene of the largest stealings recorded in late years. In the last four years $30,000 worth of cloth has been taken, most or all of which has been subsequently sold in market places up and down the country at a fraction of its real worth. The goods went out of the mill gate wrapped around the bodies of laborers or concealed in their trousers. One hardly expects robbery on this scale to be practicable in any works which are not managed by some giant corporation, but employers of only two or three hundred persons find it difficult enough to look after their goods. In many quarters there is room for systems that would bring thefts quickly to light.

The fact that quantities so large could be abstracted without detection for so long a time is perhaps a hint that the huge combines do some things worse, if they do other things better, than the man of private enterprise. Of course one hears tales about one combine and another; about the difficulty of getting satisfaction from the minor managers and officials; the loafing habits of certain satellites; the occasional discovery of irregularities between employes of the combines and persons with whom they did business. No business institution is free from flaws and the managers of the textile combines do not tolerate shilly-shallying if they see it. There are well managed combines, but none perfect has yet been sighted.

* * *

A cotton trade union's report deals with drastic candor with some weak points of Lancashire management. It says: "We have mills fitted with machinery (on credit) at prices far in excess of market value. We have firms where the management is never at peace with the operatives and dissatisfied workers are always costly. And we have mills managed by men as fit for the position as a race-horse tipster for Prime Minister. Again we have firms, hampered by want of capital, having to follow the yarn to market to get ready money." The worst of it is that the accusation is true and these unhappy concerns are thorns in the side of their contemporaries. There are inefficients in all branches and owing to concerted action in face of misfortune the weaklings in the cotton trade are saved again and again from the death that certainly awaits them. Lancashire will be all the more comfortable for a shake-out.

The union does not deny that there are mills "of many years' standing, managed and financed by practical men" and it might have added that some of them are not making profits despite the writing-down of their book-values to $1.25 a spindle. Seventeen spinning mills have an aggregate loss of $170,000 on the first half of this year, a dozen are paying no dividend, and a large number report that their dividends come out of the reserves.

* * *

According to an Australian opinion the replacement of hand-shears by machine-clippers has something to do with the improved quantity, quality and price of greasy wool locks. Over half the Australian clip and a good deal of the South African and English clips is shorn with an appliance like that in the illustration. Serrated cutting

edges, like those of the hay-cutting machine, vibrate backwards and forwards in front of a comb and lighten the labor of shearing. Some of the large sheep stations in Australia have over seventy of such machines in use. The makers say—and users believe—that an ounce or two extra per fleece can be secured with the machine-clipper. However, the ease and simplicity of the machine's use appears to tempt shearers into carelessness. They are said to be making more

A SHEARING KNIFE.

double cuts and the fine wool shorn from the flesh-side of the fleece at the second passage of the machine falls through the sorting grates and is bulked along with commoner locks. Without accepting full responsibility for the explanation I can testify to the growing appreciation shown for colonial locks by some of the most important carded woolen mills in Yorkshire. These locks are of course tariff-barred in the United States.

* * *

The carded woolen business has been much too good in Yorkshire to be interfered with by strikes and the Leeds and Huddersfield picker room hands have got substantially the concessions they wanted. For 58 hours' work the Leeds willeyer or fettler now gets $7.25; the Huddersfielder, $6.70. Taking into account the regularity of employment, the picker hand in a woolen mill is well paid as compared with commission combers' or dyers' operatives. The men have been conceded an extra 2 cents and 1 cent per hour respectively for overtime and this may help to discourage systematic overtiming.

An attempt is afoot to procure for Yorkshire weavers a 10 per cent. advance in pay and special rates for overtime. In Bradford a good woman weaver makes about $5 and minds two looms. In Huddersfield, minding one loom and weaving fine goods, a woman earns $6.25 or less and in Halifax looms are running at a cost lower by $2 to $2.50 per week than in first-class Huddersfield mills. The Bradford and Halifax men who make fine cloths are at a greater expense in mending than those who pay the best prices for weaving and they lose more in loom-waste. Of course it is natural for the Huddersfield mills to tell the weavers' union to begin upon the low rates paid by their competitors.

* * *

It is fairly certain that the use of unwashed flocks for stuffing beddings and furniture is to be prohibited in England. A movement to make the washing of flocks compulsory has been afoot for seven years and permanent-officialdom has made up its mind to the course and has the support of the Minister in power. Shoddy makers, the producers of flock, who spend all their lives amid rags and rag products, give the notion as grandmotherly and point to the absence of harm in the past. Bedding manufacturers favor legislative or administrative action, possibly because they are exposed at present to competition by men who call flocks washed or purified when in fact no cleansing has been given to them. Apparently the official requirements are to be mild enough to inflict no especial hardship on manufacturers and may be regarded as a concession to sentiment. It is not contended that raw flocks are even capable of transmitting vermin and it has shown itself as little provocative of disease as any material that it is possible to use.

* * *

Since they did away with the 112-pound

weight in the Liverpool cotton warehouses and took the cental as the standard, there has been a saving of wages equal to 1 cent per bale. If not the most important fact, that is probably the most cogent one that the British Weights and Measures Association could bring before the cotton trade. American cotton is always quoted in pence and hundredths of a penny and it is sought to have Egyptian, Brazilian, Indian and other cotton quoted in the same way. Attempts are being made to ensure a simultaneous adoption of tenths in price and weight throughout the entire cotton industry, from 1st October next. The victory will not be complete, but the movement ought to make some headway. The wool industry continues to suffer from 112-pound hundredweights, 28-pound tods, 14 1/2-pound stones and similar eccentricities. The pack (240 pounds) is relatively a useful denominator because the number of pounds in a pack equal the number of pence in one pound sterling. At nineteen pence per pound tops cost £19 per pack and it is usual to order tops by packs and to think in that dimension.

* * *

Accounts reach me of the success of a new process for lithographing designs on fabrics. The manufacture of a full-sized machine for the purpose is in the hands of a large cotton machinery firm. The printing is done on the "set off" principle and the complete design in several colors is transferred at one operation from a rubber coated cylinder to the cloth. With an experimental machine work has been done on veilings and chiffons too delicate for ordinary printing and small articles like cushion covers and tea cosies have been treated. It will be soon enough to form a final judgment when the process is actually on the market. Meantime, creditable results have been obtained and a point is made of the low cost of producing new designs as compared with the cost of engraving rollers.

* * *

Complete returns for the half year show that $705,000 of machinery were sent from Bradford to America and the amount is substantially twice as much as in the same months of 1909. The value was $108,000 in June and this seems out of harmony with the fall of $600,000 in wool exported to the United States in that month. Taken with a decrease of over $200,000 in fabrics, and the dejected reports received from all sources, the figures go to convince Bradford that America is in a dismally bad way.

IMPROVED COTTON STORAGE.

BY REGENT.

Everyone who has sailed into Liverpool has seen the usual type of English cotton store—a red brick building six or eight stories in height with crane doors and gangs of men to work the bales into position on the floors. Perhaps some have heard of the fires in these warehouses, the conspiracies of dealers in salvage cotton and of women who make a living out of sorting damaged cotton. Incendiaries have been convicted of stuffing cats through windows or ventilators, the cats having parcels of lighted combustibles fastened on strings to their tails. At all events there is a fire premium of 8/s to 12/6 per £100 (say $4 to $6 per $1,000) on cotton stored in the best fireproof warehouses of the storied type.

A new style of cotton warehouse, or "safe," as it is called, is being built at Manchester on the Trafford Park Estates adjoining the Ship Canal. The construction is fully explained by the accompanying plan, Fig. 1. The warehouses have a single floor at platform level, and import cotton is brought to the door by a dock railway at a freight of 12 cents a ton from the ship. It is passed out, Fig. 2, on the same level to the road wagons, or to trains that take the bales to the factory. The bales are manipulated and placed by overhead three-way cranes and runways. The walls and floors are of brickwork with cavity-walls connected with long bricks between each set of warehouses. The doors and roofs are of reinforced concrete and there is roof-lighting through wired glass. Electric lights, doubly enclosed, supply artificial light and the electric

wiring runs outside the building in conduits. A complete sprinkler installation is set in the roof with a water-tower overhead and an auxiliary water supply from the mains.

and roofs, brick walls and large windows. They are designed for small trades, have electric current, gas and water available and inclusive of taxes let for $400 per annum

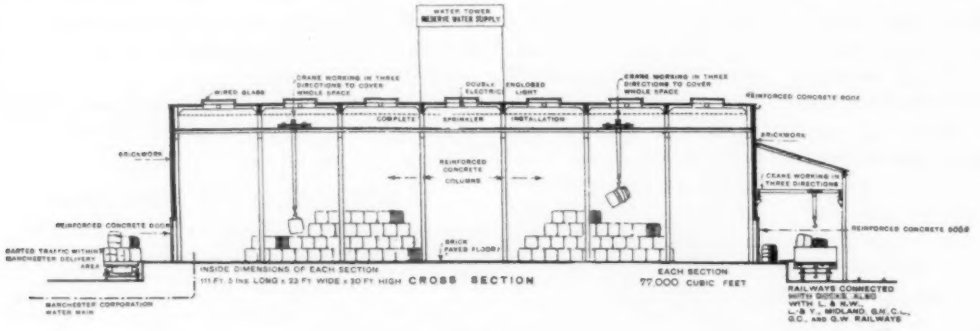

WATER TOWER
RESERVE WATER SUPPLY
WIRED GLASS
CRANE WORKING IN THREE DIRECTIONS TO COVER WHOLE SPACE
DOUBLE ELECTRIC
ENCLOSED LIGHT
REINFORCED CONCRETE ROOF
COMPLETE
SPRINKLER
INSTALLATION
BRICKWORK
REINFORCED CONCRETE COLUMNS
CRANE WORKING IN THREE DIRECTIONS
REINFORCED CONCRETE DOCK
REINFORCED CONCRETE ROOF
BRICK PAVED FLOOR
INSIDE DIMENSIONS OF EACH SECTION
111 FT. 5 INS. LONG x 23 FT. WIDE x 30 FT. HIGH
CROSS SECTION
EACH SECTION
77,000 CUBIC FEET
RAILWAYS CONNECTED WITH DOCKS, ALSO WITH L. & N.W., L. & Y., MIDLAND, G.N.C., G.C., AND G.W. RAILWAYS
MANCHESTER CORPORATION WATER MAIN

FIG. 1.

Each safe is divided into sections 111 feet 5 inches long by 23 feet wide by 30 feet high, and measures cubically 77,000 feet. The

with all advantages of rail and water transit.

The safes are new and only four sections have been completed. Although they are

FIG. 2.

rent per section is fixed at $600 per annum, which charge covers taxes. The fire premiums are $1.20 to $1.50 per $1,000, as

ugly they are believed to be secure and not costly to construct. Even to making the ventilating pipes point downward instead of

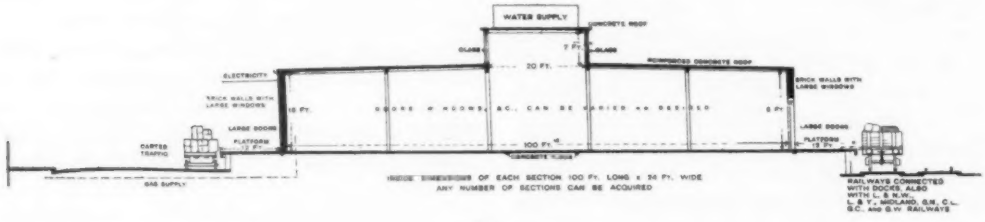

WATER SUPPLY
CONCRETE ROOF
7 FT.
GLASS
20 FT.
REINFORCED CONCRETE ROOF
ELECTRICITY
BRICK WALLS WITH LARGE WINDOWS
BRICK WALLS WITH LARGE WINDOWS
LARGE DOORS
PLATFORM 12 FT.
CARTED TRAFFIC
GAS SUPPLY
100 FT.
CONCRETE FLOOR
INSIDE DIMENSIONS OF EACH SECTION 100 FT. LONG x 24 FT. WIDE
ANY NUMBER OF SECTIONS CAN BE ACQUIRED
RAILWAYS CONNECTED WITH DOCKS, ALSO WITH L. & N.W., L. & Y., MIDLAND, G.N.C., G.C. AND G.W. RAILWAYS

FIG. 3.

against $4 in the usual warehouse, or $1.60 to $2.16 as against $6.

Factory buildings known as "hives" are being built on the same estate on lines approximately similar. These are shown at Fig. 3. They are on one floor and at platform-level, divided into sections 100 feet long and 24 feet wide, with concrete floors

upward—as a precaution against engine-sparks—every care has been bestowed on their design.

The largest crop of cotton grown in the United States was in 1908-9; 13,829,000 bales; in 1906-7 the crop was 13,551,000 bales, and in 1904-5, 13,557,000 bales.

CARD GRINDING.

(From the Grinding and Mounting of Card Clothing recently published by Dronsfield Bros., Ltd., Oldham, England.)

(Continued from July.)

The Rhodes flat cleaner is the only stripping apparatus possessing two separate brushes, thus permitting of the double picking and sweeping action. Many other combination bristle and wire stripping rollers are manufactured, but all possess the simple revolving action.

We would here like it to be understood that the apparatus described is a flat cleaner only, and intended for occasional use in ridding the flats of objectionable impurities. Although the same is guaranteed not to injure the flat clothing, we do not consider the constant use of wire covered stripping rollers, the running of wire against wire, as advantageous to the card points, but rather the reverse. The speed of the apparatus should be slow, say about 30 to 40 revolutions per minute. It should be set gradually down and allowed to work its way to the foundation of the flat clothing. With careful setting into the flat, the apparatus will clear out the dirtiest card in about two days. Flats simply seed choked, without felting, may be cleared in one day.

THE GRINDING OF NAPPER ROLLERS.

Among the subsidiary machinery in use for the manufacture of cloth may be mentioned particularly the cloth raising or napping machine, of which the rollers are covered with card filleting.

These rollers, to the number of from 14 to 36, are mounted side by side in steps attached to circular revolving frames, and when thus mounted they present the appearance of a cylinder made up of separate card covered rollers. Over the rollers is passed the cloth, which undergoes the raising or napping operation from the points of the card teeth of the rollers as they revolve with that peculiar "sun and planet" motion against the face of the cloth; this motion is obtained by the revolving of the rollers upon their own axes, in addition to the circuit they describe round the central shaft. The raising or napping of all cloth, both cotton and woolen, such as flannelettes, cotton and woolen blankets, shawls and hosiery, was at one time accomplished by the aid of teazle gigs, but now nearly all cotton and many woolen cloths are raised by the card raising machine, on account of increased production and regular napped surface.

The majority of raising machines are built of wide width, varying from 72 to 100 inches of wire surface. The rollers are small in diameter, 2 1/2 to 3 inches without clothing,

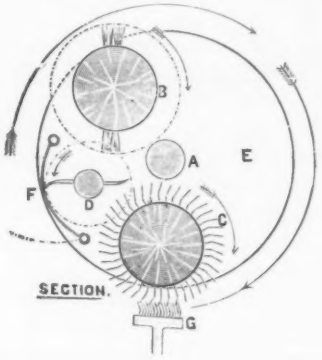


FIG. 26.

the object being to allow the card teeth to seize the "nap" and draw it up from the woven web of the cloth.

For a long time after the introduction of the napping machine, the grinding of the raising rollers, most of which are clothed with "side" ground card filleting, was of an extremely primitive and unsatisfactory character. The only attempt at grinding was by running the rollers together, teeth into teeth, while pouring into the filleting a mixture of emery and oil; this method was, naturally, ruinous to the card clothing, inasmuch as the teeth were bent or broken and the oil penetrated into the rubber foundation of the filleting and quickly destroyed it. As will be seen, this method of grinding affected only the actual points of the wire, and that not satisfactorily. No attempt was made to true up the roller surfaces, consequently uneven raising resulted. Furthermore, the rollers were so soiled with the mixture applied that it was necessary to pass a special

length of cloth through the raising machine in order to clean them and render them fit for operating upon the pieces.

The Dronsfield patent grinding machine for raising rollers, Fig. 27, was invented some years ago to deal expressly with the rollers used in all kinds of cloth napping machines. It is designed with a view of producing parallel grinding of the card surfaces, in addition to the regrinding of the sides of the card teeth in order to maintain

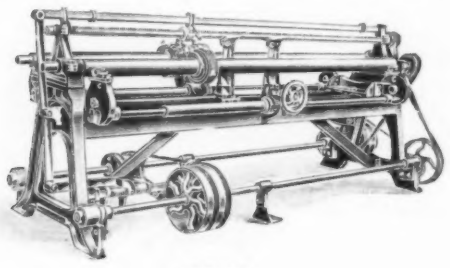


FIG. 27.

the sharp point so necessary in the raising of the cloth nap.

Many benefits have accrued from the adoption of this system of grinding. First, the card clothing lasts longer, for evident reasons; it is not subjected to the severe "lashing" strain as under the old order of things, consequently the wire teeth are not loosened nor broken. Second, owing to the rollers being maintained parallel, cylindrical and well pointed, the raising is more uniform and more quickly accomplished, rendering it unnecessary to pass the cloth as many times through the raising machine. Third, owing to the clean manner of grinding, no oil being used upon the emery, the rollers are ready to commence raising immediately, without the necessity of the extra passage of a cleaning cloth, thus saving time and increasing production.

The patent raising roller grinding machine is arranged so that two rollers may be ground simultaneously, the one "surface" ground and the other "side" ground. Two traversing grinders, one fitted with an emery fillet covered disc, and the other with a boss carrying "side" grinding rings, see Fig. 2, are mounted on the frame, and both are traversed by one screw. The raising rollers are mounted in patent center setting motions, one on each side of the machine; these motions, which carry the rollers, ensure parallel grinding, both ends being adjusted simultaneously by the arm wheel in the center. The machine is arranged so as to grind rollers of all widths, one end of the machine bed being made in the form of a slide, enabling the steps to move in to suit any width of roller. The traverse is adjusted to correspond, by a patent reversing motion, shown under the machine, which is actuated, through the lever arrangement, by the stops on the top bar; the position of these stops determine the length of the traverse.

(To be continued.)

THE NEED OF A NATIONAL CHILD LABOR COMMISSION.

I read with a great deal of interest the article in your June number on "Our Mountain Problem and Its Solution," and I would like to take this opportunity to say a few words concerning my own observations and experiences during a recently ended three years connection with a hosiery mill in the mountains of western North Carolina. As far as he has gone I heartily concur in all the points made by Mr. Dawley. The employment of the mountain children in the cotton mills of the South brings about a great improvement in the condition of a large majority of them over what they had in the poverty of their mountain homes.

One of the greatest benefits of the mill life is the "fixing of habits of industry."

This, however, is only one step in the solution of the great problem and we should take warning from England's one hundred years experience in employing child labor in her mills. Her vital statistics among this class of people show an alarming decrease in physique and mentality during the last century.

Child labor in the South as in every other section of the country, unless very wisely regulated and restricted, is a great evil. The civil war left the South in an impoverished condition, a condition little realized by

people who have not actually seen it. The value of taxable property was so reduced that the taxes were far from sufficient to provide funds for educational or philanthropic work among these people. The growth of the cotton mills means increased taxable property, more taxes, bigger school appropriations, more and better schools.

It also means greater facilities for public institutions to take care of those unfit to take care of themselves. Even today, in the town where I was located, the public school for white children was open from four to six months a year, according to the fund available, while the colored school, supported by mission funds, ran for nine months. The white school did not run short time for lack of children to attend either.

The Southern cotton manufacturers deserve all credit for providing to a great extent the means to increase educational facilities and to put the people in a position where they can avail themselves of these opportunities. But we must not stop here. In all justice to future generations and for the well being of the nation itself, any institution must not be allowed to continue unchanged so that it will cause a deterioration of the race.

It's of no use to sit back with folded hands and see some wrong, criticize the condition, say it should be stopped and still offer no solution of the problem.

Let us be constructionists in spirit at least, face conditions as they are, and see if we can devise means to bring about a betterment of present conditions. This problem is one of enormous proportions and will take the combined effort of many minds for its solution. Fundamentally there are two elements which will bring about an improvement of present conditions: Increasing the age at which children can be lawfully employed and providing means whereby they can receive proper educational, physical and moral training, and if need be actual support until they reach that age.

Concerning the first point, I say "increasing" the age limit advisedly, as to my certain knowledge many children ten years of age and under are employed in textile mills today, although in most States the age limit is 12 to 14 years. This of course is wrong.

The laws relating to the age of employment, however, are seldom if ever enforced, and during my three years sojourn in the South I never once saw a mill inspector or ever heard of one being around. Manifestly the age at which children can be employed should be the same in all states, otherwise manufacturers in one locality would have an unfair advantage over those in another locality where the age limit was higher.

It is too much to expect that the legislatures of every state will pass laws making uniform the age at which children can be employed. Hence it remains for such laws to be made by the federal government. But how is the federal government to obtain information so that it can make such laws wisely? By the establishment of a permanent National Child Labor Commission, possibly as a bureau of the Department of Commerce and Labor, to investigate fully conditions in this country and abroad, advise as to the proper legislation and with power to see that any laws passed are enforced. It would be impossible without working great hardship on a vast number of people, to establish the proper age limit at one time, but it could be established gradually on a differential scale to the benefit of both the employer and the employed.

For example the age of twelve might be set first,—two or three years later let this be increased to thirteen, then to fourteen and so on until a proper age, established by investigation, had been reached. In regard to the second point, to a large extent education must be under the control of the States, which should both provide the proper schools and make the attendance compulsory. The National Commission could, however, have very material influence even here, as it could require attendance of a certain number of months at school each year before children are permitted to work in the mills. As a matter of fact, many Southern mills do exactly this thing today and furthermore provide and keep up the schools for

their mill villages. Any such laws as suggested here, with universal enforcement, are bound to work hardships in isolated cases, but the few must suffer for the many, and certainly with all the organized charities in existence today, some means could be found to provide help for those worthy of it.

Give the children a chance. They are worth it. They make the men and women of tomorrow.

H. M. Wilcox.

HYGIENIC APPARATUS IN ITALIAN MILLS.

From Uhlands Technische Rundschau.

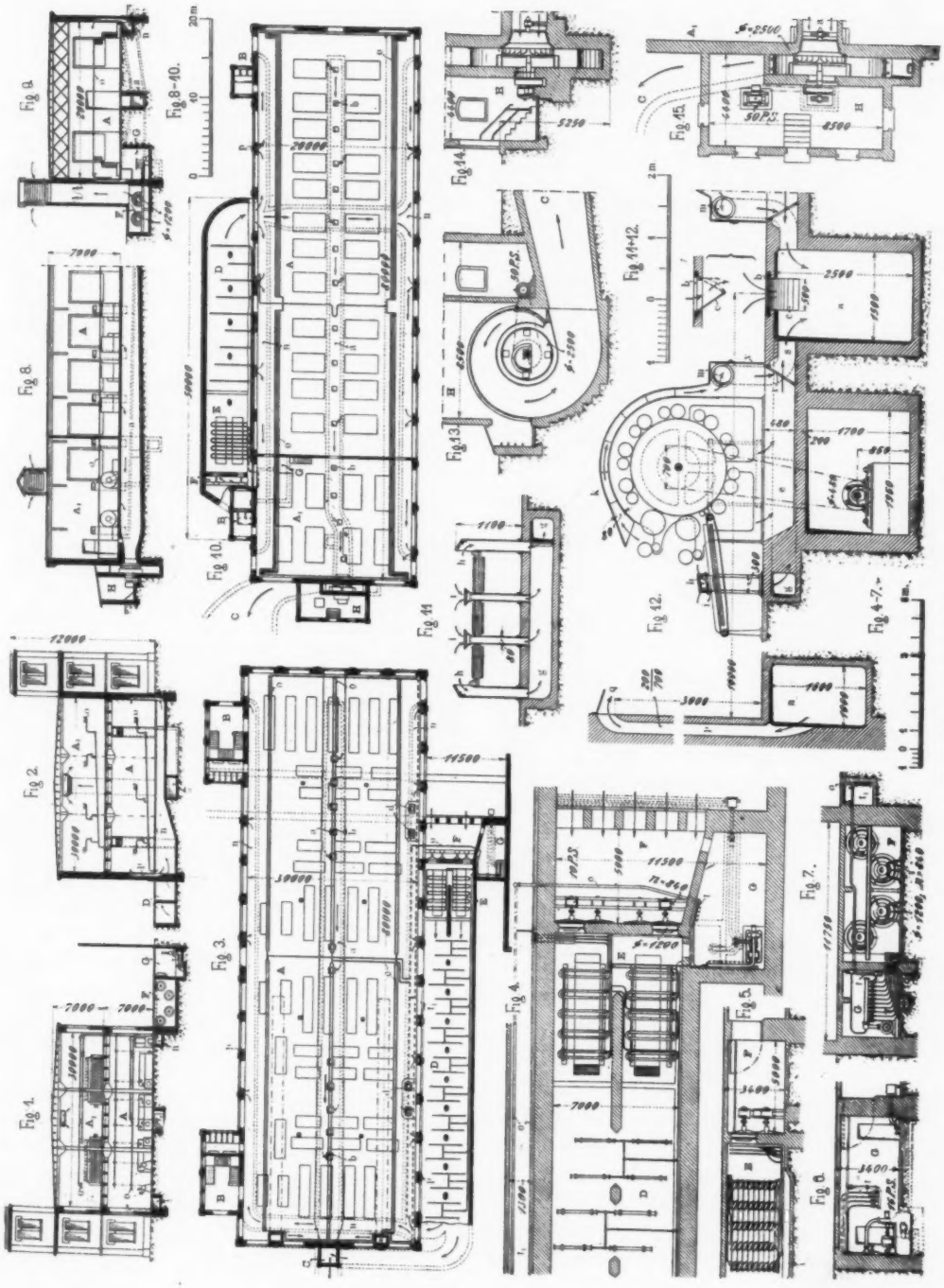
(Translated from the German by the Editor of the Textile World Record.)

Italian manufacturers have not only relied on their own experience, but also on the developments in other countries, in fitting up their mills. This fact is plainly shown by the new mills that have been built in recent years in Italy. The most of them in their technical equipment are unexcelled anywhere. This plan of adopting the best to be found has been carried out by the Italian manufacturers in the hygienic equipment of their plants, this being plainly demonstrated by the examples shown in the accompanying illustrations. We are indebted to Director Pontiggia of the Associatione Industriali d'Italia for the following names of the firms that installed the ventilating, heating, air moistening and dust removing apparatus in various Italian mills; for the spinning mill at Cassano, Gebrueder Sulzer, Winterthur, Germany; for the mill at Fara, Recknagel, in Munchen, for Fratta Maggiore, the Vereinigte Maschenfabrik, Augsburg.

Thus the reader has an exceptional opportunity to study the apparatus turned out by these three leading firms. Figs. 11 to 15 show the apparatus used in the card room of the flax spinning mill at Cassano d'Adda. Fresh air is forced into the work rooms and at the same time the foul air is sucked out by ventilating fans. The general ventilation of the mill is combined with the local ventilation of the card room, so that the dust from the machines is carried off with the foul air from the work room.

The card room, Figs. 8 to 10, consists of a large one-story room, A, A1, having an area of 260 ft. by 65 ft., and being 23 ft. high. In the largest division of this room, A, are placed 28 flax cards; and in the smaller, A1, 8 jute cards. These machines are well covered in order to facilitate the removal of the dust, Figs. 11 and 12. Drawing the air from below, see conduit, f, Fig. 12, is not only a convenient, but a very safe arrangement. The ventilation provides for a change of air five or six times an hour. The ventilators, F, H, are thus required to deliver about 2,000,000 cubic feet of air per hour, which the heating apparatus, E, is able to warm, so that a temperature of 23° F. on the outside is raised to 46° F. on the inside. The air moistening apparatus, Figs. 8 to 10, is arranged to maintain a relative humidity of 70 per cent. in the work room. Two Sulzer ventilators in room, F, draw pure air through the Venetian blinds in the tower and force it to the heating and moistening apparatus, E, D, in the room, A, A1. These ventilators, 48 inches in diameter, are connected with an electric motor of 10 h. p. running 800 turns per minute.

The steam heating apparatus, E. consists of four groups of corrugated pipes, so arranged that one or more of the groups can be used as desired. The steam pressure is kept at 4 to 5 atmospheres. The air passes from the heater to the moistening apparatus, D, and thence through a long tunnel having a sectional area of 130 square feet. Ten water pipes are laid in the bottom of this tunnel, and in these pipes are fixed perpendicular pipes of various heights like organ tubes, having on the top of each a spraying head, so that the entire tunnel is filled with water as in a heavy rainstorm. This water is supplied by a Sulzer centrifugal pump in room, G, the pump being driven by a 6 h. p. electric motor. In warm weather it is stated that all of the water forced through the pipes is distributed by the air, while in winter the surplus is carried back to the pump to be fed again to the pipes in the tunnel.



HYGIENIC APPARATUS IN ITALIAN MILLS.

From this large moistening tunnel, D, the air passes to two subterranean conduits, n, Figs. 8 and 14, from which it is delivered to conduits arranged 15 or 20 feet apart, and delivering air into the workroom about 10 feet above the floor, Fig. 14, n and p. Over these openings into the rooms are self closing covers which are forced open by the air pressure, giving the air a downward direction. These doors can be also fixed in position so as to regulate the supply of air. The foul air and dust is carried from the rooms by the conduit, a, shown in Figs. 8 to 10. This conduit is connected with the interior of each carding machine by the conduits, e, m and g, and is also connected with the open air of the workroom by the grating, b, in the floor. A large centrifugal ventilator in room, H, sucks the dust-laden air from the conduit, a, and carries it to a much longer conduit, C, in which the dust is deposited by a spray of water falling in the form of a heavy rain.

The large ventilator, Figs. 13 to 15, is 8 feet in diameter and driven by a belt from a 50 h. p. electric motor. It is capable of handling all the air from both of the ventilators in the room, F, and produces an air depression of 3 inches in the water column.

By the original plan the dust from the cards was to be carried through the grating, r, to the conduit, e, and then to the large conduit. A door, as shown in Fig. 12, was provided to enable the grating, r, to be cleaned. The first tests, however, showed this arrangement was not satisfactory. The grating became closed and the dust accumulating in the forward parts of the card and on the feed table and doffer, was blown into the room. It was therefore decided to arrange the apparatus as shown at Figs. 14 and 15. In place of the simple cover originally planned, the cap, k, was provided, being connected by the conduit, m, with the canal, a. In this way the doffer dust was carried directly from the card.

In addition the suction head, h and i, was adjusted in the center of the feed table of each card and was connected by the conduit, g, with the canal, a. The result was entirely satisfactory. All parts of the card are easily accessible for cleaning without disturbing the ventilating apparatus. The grating, r, can be cleaned by opening the doors, v.

All the adjusting apparatus is concentrated in the pump room, G, so that the entire system of ventilation, heating and air moistening can be regulated at this point. The installation in the preparatory building, shown in Figs. 1 to 3, provides for two rooms, A and A1, each 260 by 98 feet and 23 feet high. Here the ventilation is effected by a change of air four or five times an hour. The interior temperature is maintained at 50° to 54° F., as compared with the exterior air temperature of 23° F. The relative humidity is kept at 75 per cent.

On the first floor, A, are 21 gill boxes with one spindle box and two drawing machines. Four ventilators in the room, F, each driven by a 10 h. p. motor, delivers fresh air to the heating room, E, thence to the moistening canal, D, Figs. 3 and 4. The ventilation is obtained in the same way as in the card room. The foul air and dust escape through the subterranean canal to the conduit, C. A Sulzer centrifugal pump, G, delivers water at a pressure of 5 atmospheres to the moistening canal, D, and is driven by a 16 h. p. motor. The pipe of the moistening apparatus, D, is divided into ten sections, each having 8 perpendicular pipes. Each perpendicular pipe is divided into three sections to enable the supply to be regulated as desired. For particularly cold days an auxiliary steam heater is provided, which consists of flexible pipes, carried into the workrooms and supported on hangers at the ceiling.

In the last 20 years or so the average earnings of workpeople engaged in the textile industries has risen over 20 per cent., and the total wage bill at present is something like $250,000,000 annually.

Between 1880 and 1909 the exports of cotton to the United Kingdom increased about 50 per cent., those to Germany nearly 700 per cent., while those to France more than trebled.

RAMIE.

By FELICIEN MICHOTTE, in L'Industrie Textile.

(Translated from the French by the Editor of the Textile World Record.)

Further discussion of the ramie problem may seem superfluous. Nevertheless, there is a certain use for it at the present time. The discussion, which has been slumbering for several years, has again become a matter of current interest, owing to several new experiments. Is this problem insoluble and why is it periodically revived? Previous to 1889 it attracted official attention and an exhibition of machines for decorticating ramie took place under the auspices of the Government in 1888. In 1889 there was another public exhibition at the World's Fair. In 1890 there was an unofficial exhibition of decorticating machines. In 1900 another World's Fair gave occasion for a ramie exhibition and Congress under official auspices. From that time up to 1909 the silence was almost complete. Last year the discussion was revived.

These various efforts show that the question possesses an important industrial interest, since the attempt to solve the ramie problem is revived at regular intervals, notwithstanding repeated failures. Ramie is of interest for several reasons and its industrial position has long since been established. It is of special interest in connection with our colonies, where it is capable of extensive exploitation. If, notwithstanding these reasons, the industry has failed to develop on a large scale up to the present time, it will be interesting to examine the causes. These causes are various and show that the development has been retarded by unfavorable influences. The efforts of the government instead of being of advantage have been quite the reverse. I am stating a fact and not criticising the laudable purpose which prompted the Government to make the effort it did to place the industry on a sound basis. Work was carried on by those who were ignorant of the subject and who were misled by others having special interests to promote. The work of the ramie commission has been carried on without a well defined plan and on the strength of the misinformation furnished by interested parties. The only object has been to promote the industry in France. That is as great a mistake as to promote the culture of the date tree here.

At the exhibition in 1889 the ramie machines gave results of very doubtful value, but from which it was possible to draw certain conclusions regarding the economic question. This, however, was not done, but instead of that the conclusion was drawn that the problem of decorticating ramie had been finally solved by the use of a certain machine with a special method. As a result, ramie was planted, machines were bought and then it was discovered that the cost of production was so high as to be prohibitory. Medals were granted for machines which everybody knew were failures.

From 1889 to 1900 various corporations were organized for working ramie. These companies were all failures, because they came in conflict with economic conditions. In 1900 a preliminary congress announced that the question had entered on a new stage. Unfortunately the congress, when it assembled, instead of aiding in the solution of the question, served only to complicate it. Under the influence of private interests resolutions were adopted which were in conflict with the facts and contradictory to each other. We were informed at that time that ramie decorticated dry was required by the spinners, being the only form in which the fiber could be used. Then it was announced that the problem of drying it had been solved, a promise being made to give a demonstration. This was not done, however, because it was impossible. Under the chaotic conditions then existing, many concluded that ramie was not capable of being worked successfully.

At the next exhibition personal interests were again dominant and medals were awarded for machines of no industrial value, a point totally ignored by the jurors. The result was the organization of companies to exploit machines which had only the medals to commend them. The result in every case was failure. From 1889 to 1900 there was a series of ramie processes proposed by so-

called inventors, but the only result was to obtain subscriptions to capital stock, which in nearly every case was the only result expected by the promoters. In this way the ramie industry was greatly damaged, as it dampened popular enthusiasm and led to the false conclusion that the working of ramie was impracticable. This in fact was the only conclusion that a stockholder who had lost his money would naturally reach.

On the other hand plantations have been established and the question arises whether they will succeed. I answer, yes, but on one condition, that experience be taken as a guide and past errors avoided. Evidently these conditions are not to be fulfilled, since the new efforts are based on the exploitation of a machine which, for fifteen years, has invariably proved a failure wherever it has been used. In order to succeed in working ramie on a scale similar to that on which hemp and flax are now worked, it is necessary to take the economic question into consideration. Ramie has demonstrated its industrial possibilities. Notwithstanding the series of failures, the spinning of China grass has in many cases been followed by gratifying results. The German mill at Emmendingen has paid fairly good dividends for a number of years. The French mill at Entraigue, after having abandoned the exploitation of a certain machine and a system of dry decorticating, is giving good results. The mill at Bellegarde was also successful until its managers undertook the cultivation of ramie and the exploitation of a decorticating machine. At Lille a spinning mill has failed, but the fault was in the manager, who wished to exploit a system of decorticating the fiber. At Lyons a spinning mill has been in operation for some years, giving good results.

As far as spinning is concerned, the only difficulty is in obtaining a supply of the raw material. This is a serious shortcoming, seeing that all the mills are obliged to use China grass, of which there is but a limited supply. A ramie spinning mill is therefore obliged to manipulate a material of which the supply and the price are uncertain. In order to develop the spinning of ramie it is necessary to increase the production and lower the price of the product. These two problems are connected with the establishment of plantations. The raising of the fiber must be on a scale that will result in a price at least as low as that of China grass. Is this possible? I answer, yes, notwithstanding the obstacles encountered in recent years. The various firms that have started plantations have attempted to exploit a special system instead of treating the work as an agricultural problem.

To work the ramie fiber successfully it is necessary to decorticate it. It is not enough to pass two or three stems through a machine every fifteen minutes and obtain a beautiful fiber. It is necessary to decorticate it economically. In decorticating ramie economically there are two points which the inventors of the machines or processes have invariably overlooked. The first is the low yield of fiber—2 1/2 per cent. in place of 15 per cent., as in the case of hemp. The second is that the leaves represent 50 per cent. of the weight of the crop. In order to handle the fiber economically it is therefore necessary to avoid the labor of stripping the leaves and avoid transportation of the material. The problem of getting rid of the leaves has been solved in fine fashion by the inventors by having women and children pass through the fields and strip the leaves by hand. At the exhibition in 1889 and 1900 a leaf-removing machine called "La Francaise" was disqualified because the judges specified that the decorticating tests should be made with ramie from which the leaves had already been stripped. Stripping the leaves by hand, however, is impractical because it is impossible to find the women and children to do the work, even on a small scale. As a matter of fact, however, it is necessary to cultivate ramie on large plantations. As a result, any system based on stripping the leaves by hand is condemned in advance.

The question of transportation is not less serious. A crop of ramie from which the leaves have been stripped weighs from 25,000 to 30,000 pounds per acre; with the leaves on it weighs from 50,000 to 60,000 pounds

per acre. The difficulty involved in transporting this quantity of material is evident, especially in view of the fact that the yield of raw material amounts to only 3,300 pounds. It is therefore necessary to decorticate ramie in the field with the least handling possible. Transportation to the mill, no matter how near the mill may be, is wholly out of the question. The need is for a decorticating machine that can be transported from one part of the field to another.

Another requirement is that the machine shall handle the stock as economically as possible. To do this it must treat a large part of the stems at one time. As a result the machines handling only two stems at a time were out of the question. Likewise the direct movement machines in which the stems are placed in a special sheaf were impracticable. Another question is whether the machine should handle the China grass or the stems covered with the bark. This is a secondary question, as it is possible to degum one as easily as the other. It is necessary that the machine should decorticate the fiber with a minimum waste and not with a loss of 70 per cent., as in the case of certain machines that have been built.

I have not made any reference to the so-called chemical processes of decorticating ramie. Those have never been successful because the chemical solutions dissolve the wood and with it the fiber. Moreover, the large volume of material that must be handled makes the problem more difficult with a chemical process because the weight is increased by the successive solutions. Recently I had occasion to examine one of these chemical processes and found that the cost was higher than the price of China grass in Europe.

My conclusions may be summarized as follows: Establish plantations and operate only with economical processes. This may be considered a truism. That is so, but it is necessary to add that it has not been realized during the past twenty-five years. In the interest of the ramie industry, as well as of those who may invest their capital in this branch of the business, it is to be hoped that future work will be carried on in the light of past experience. I will also add that the question of degumming has long ago been solved, not only by one process but by a number which vary very little from each other. The principle is the same for all.

CAMEL HAIR.

(By Our Special English Correspondent.)

The camel hair branch of the textile business has been much neglected by technical writers, who perhaps find an excuse in the relative smallness of this department? So far as England is concerned the position of camel hair in the scale of things can be indicated by a glance at the imports. Nine or ten million pounds a year of camel hair are imported, as against 25 to 30 million pounds of mohair, or 650 to 800 million pounds of sheep's wool.

Leaving out of account sundry small courses of supply, it appears that half the weight comes from Russia and half from China. The Russian supply is shipped from Black Sea ports, being the produce of the Caucasus district. The China supply comes from Tientsin, off the camels of Northern Asia, and the China hair is preferred partly on the score of its better growth, partly because it is graded better.

Camel hair is dealt with in Shanghai and Tientsin much in the same manner as silk is and by firms which are also in the silk business. Carlowitz & Co. and Arnhold, Karberg & Co. are the names of two exporters regularly handling this article. I am informed that Helmuth Schwartze & Co., London, are the principal brokers of Russian hair.

Users of camel hair do not pay for their material until they have had an opportunity of carefully examining it and as shippers of it require cash before liberating the goods an importer is thus introduced into the business. I am told by an importer that considerable anxiety has been caused by shipments of imperfectly cleaned and graded Russian hair and by the presence of what is called "mine stuff" in China hair. Camels, it seems, are used in connection with mining in Siberia and a blue stain presumably of cyanide spoils some parcels. The hair is

bought as firsts, seconds and thirds and there is a proportion of 65, 25 and 10 per cent. respectively of each in most deliveries. Against his will, the buyer of China hair has also to accept a certain proportion of white. The business of working camel hair is one in which a fortune or two has been made in Bradford, but in the present-day competition ordinary profits cannot be excessively large. Raw hair is treated by relatively few firms, of whom the chief are Salts of Saltaire, Cooper, Jr., and Feather, Scriven & Dawson, Bradford.

The animals from which this Russian and China hair comes are the brown Bactrian or two-humped camels, natives of Central Asia. They are kept not for the ten or twelve pounds of hair they yield annually, but for their service as beasts of burden, capable of carrying 600 to 1,000 pounds of freight for distances of 30 to 35 miles a day. They are superior in strength and hairiness to the swifter Arabian dromedary and they live longer than the Indian camels. The Baetrian camel, according to F. L. Simmonds of the South Kensington Museum, lives forty to fifty years, comes to maturity in its fifth year and is clipped every spring after the second year. The Indian, whose colors range from black to white, and include cream, drab and mouse colors, lives about twenty-five years. The African camels live thirty years and are of course numerous. According to a responsible estimate there were about a quarter of a million of these in North Africa thirty years ago. The hair of these beasts is thin, whitish and fine and unlike the bushy, brown hair of the Asiatic breeds.

It is apparent that the camel yields virtually two kinds of hair, and the soft down of the body and the strong beard hair of the under side of the neck, the upper part of the legs and the humps. Out of this strong hair the Mongols have been wont to make ropes and in Bradford the beard-hair is combed out to make belting, press cloth and carpet yarn for pile carpets. The soft body hair passes chiefly into the noils and when the price of noils is good enough the top is combed again and again to extract as much body hair as possible. There have been times when the price realized for camel hair noils has paid for everything, leaving the proceeds of the sale of tops as clear profit. There is a constant demand for these noils from the felt hatting industry and they are used steadily in marking Jaeger clothing and special sorts of underwear. They are valuable for making soft-handling cloths of many types, and although a trailing surface of camel noils does not wear well on tweeds and overcoatings they are employed from time to time for that purpose.

The price is a somewhat fluctuating one and the noils are graded like the raw hair from which they come, as firsts, seconds and thirds are selling at present from 50 down to 20 cents a pound. I send, for any interest it may have, a sample of long noil containing some of the strong hair, for which 45 cents is asked.

It will be seen that the price of noils is high in relation to the price of hair. The average import price of all camel hair from all sources was about 11 1/2 cents a pound for the two years 1906-07 and about 16 cents in 1908-09. The inquirer who asks how it happens that such large quantities of camel hair noils are offered can be told that always the proportion of noil to top is large and that in some conditions the noil is the major source of profit. When the latter is the case the producers of belting yarn are left to scour the market for "cow-tail" English wool, human hair or any strong, rough stuff they can possibly substitute.

The same inquirer asks whether there are any substitutes that are sometimes sold as camel hair noils. There is no raw material which has the same characteristics and comes in at the same price. Undoubtedly substitutes are sold in manufactured belting, but spinners and manufacturers are not easily deceived and might be relied on to detect an imposition. Although I know of no case of attempted deception as to the nature of the noils, I do know that one ingenious person sold quantities of a mixture that replaced camel noils at a time when those were nearly unobtainable. Tussah silk waste was cheap then and blending this with

materials not disclosed, he produced an avowed substitute which users were glad to get temporarily.

Camel hair noils are worked up in various ways according to the purpose to which they are put. The raw hair is liable to convey anthrox and is scheduled officially as dangerous, so that the preliminary handling and sorting are done under precautions against infection. The hair is carded after being cleaned and washed and is then combed on wool combs. The top is spun on the Bradford worsted principle either on cap or fly frames and is woven according to needs. Some of the yarn is woven on patent looms into a multi-ply fabric for belting. Other parts of it are woven on carpet looms. The manufacture is conducted in general without any radical departure from the well known and understood worsted system and appears to present no insuperable difficulties to beginners. The industry in Bradford is in the hands of those who have specialized in it, but in this respect the camel hair department does not vary from other branches. Each sort of wool and hair has its own particular devotees in that city.

The estimated value of the cotton crop in the United States for 1909 is $812,090,000 compared with $681,230,000 for 1908; $700,960,000 for 1907, and $721,650,000 for 1906.

There is about $70,000,000 invested in the linen industry in Ireland. There are 935,000 spindles and 36,000 power looms; 70,382 people are employed, whose annual wages amount to $16,500,000.

The exports of wool from Buenos Aires to the United States for the three months ending March, 1910, amounted to $9,427,355, an increase of $1,499,676 over the same quarter in 1909.

The total production of wool from the State of Victoria, in Austria, amounted to 87,536,450 pounds in 1908-9 and 95,332,829 pounds in 1909-10. The wool produced last season was worth approximately $20,293,000.

Dyeing Cotton Duck.

Editor Textile World Record:

Kindly inform me the kind of machine and class of dyestuffs the enclosed samples of cotton are treated with, that is, are they padded or jigg dyed? Is the brown dyed with cutch, the black with an aniline salt black and the red dyed with artificial dyes? Dyer (1191).

All three of the samples submitted have been dyed with direct cotton colors, for when boiled for a few minutes in a dilute solution of soda ash in contact with a piece of white cotton, the dyes bleed strongly onto the white cotton sample. Although the brown is a cutch shade, it has not been obtained with the natural dyestuff, or tannin, known as cutch. Had this been the case the cloth would have acquired a harsh, stiff feel owing to the tannin and metallic salts, bluestone and chrome, employed in the process of dyeing this coloring matter. The dyed fiber would also have shown the characteristic reaction for tannin with iron salts, which this sample failed to do. Probably this cloth was dyed with Fast Cotton Brown G, or other similar direct brown of this type, brought to the desired shade with a red or orange dyestuff.

The black sample has also been dyed with a direct cotton color, for although possessing a deep and full shade, in contradistinction to aniline black it is not at all fast to washing. This deficiency also eliminates the possibility of its being dyed with a sulphur black or a diazotized and developed black.

The dark red or maroon is evidently a compound shade obtained with a red of the benzopurpurin class, as the color turns a dark bluish black when spotted with acid.

Although it is impossible to judge with absolute certainty from the small samples submitted, it is probable that these goods have been dyed on a jigger, as there is no evidence of an excess of coloring matter on the surface such as would be present were the padding method of dyeing employed.

Howell.

The production of Egyptian cotton in 1909 was 911,000 bales, compared with 1,275,000 in 1908, a loss of about 28 per cent.

Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

Calculating Cost of Sateen.

Editor Textile World Record:

Please give us a method of calculating cost on a 36 inch, 64 by 80, 5.10-yard sateen made with a 34 warp, based upon a specific price for yarn weaving, etc. Adams (1197).

The following example is for the construction given by "Adams," using 100 yards of cloth as a basis, and figuring on a specific price for yarn, weaving, etc., which may or may not be exact, owing to prices varying at different times of the year and in different localities:

64 (ends per in.) × 36 (in. wide) = 2,304.

2,304 + 24 (extra for selvage) = 2,328.

2,328 (ends in cloth) × 100 (yards) = 232,800 yards of yarn in 100 yards of cloth.

840 (yds. per hk.) × 34s = 28,560 yds. of warp in 1 lb.

232,800 ÷ 28,560 = 8.15 lbs. of yarn in 100 yds. of cloth.

Owing to the yarn being sized, so as to prevent breakage in the weaving, and the interlacing of the yarn over the filling, about 10 per cent. is added to the weight of the yarn, giving an actual weight of 8.96 lbs.

Weight of goods = 5.10 yds. per lb. 100 yds. ÷ 5.10 = 19.60 lbs. of cloth.

19.60 (lbs. in 100 yds.) — 8.96 (lbs. of warp) = 10.64 lbs. of filling required.

10.64 lbs. × 840 = 8,937.60 yds. of No. 1 filling required.

80 picks × 38 1/2 (in. in reed) = 30,800 inches of filling in one inch of the cloth, or 3,080,000 yds. in 100 yds. of the goods.

3,080,000 ÷ 8,937.60 = 34.46s, size of filling.

As mills rarely use half numbers, the filling count is called 34.

The next thing is to find out the proportions of warp and filling:

8.96 × 5.10 = 45.696 or 46 per cent.

10.64 × 5.10 = 54.264 or 54 per cent.

The items entering into the cost of the goods are as follows:

Cotton (less waste).

Labor (on yarn).

General expense.

Weaving.

For 34s yarn it would be possible to use 1 1/8 inch staple cotton, which costs about 18 cents per pound. If this is combed there will be a shrinkage of approximately 33 per cent., thus making 2 pounds of combed cotton to cost 54 cents, or 27 cents a pound. To offset this there is the income from waste, so that it is a good plan to add one-third to the price of the cotton, making 24 cents a pound.

The labor is a very indefinite factor, but in a modern mill it should not exceed 5 cents, or at the most 6 cents a pound. If the filling has been of a different number from the yarn we would have had to get a labor cost for each, and this is where it is necessary to have the percentage of warp and filling.

Next comes the general expense, which includes everything not taken care of in the labor and weaving. The item of labor simply means the labor required to make the yarn, that is, the carding and spinning of the yarn. The principal items are office expenses, interest, taxes, engine cloth room, machine shop and yard pay rolls, supplies and repairs. This, of course, varies in different mills, but should not average over $100,000 per year for a mill of say 1,000 looms. This would mean $100 per loom each year, and with a loom turning off about 1,800 pounds of cloth a year, would mean about 54 cents per pound.

The weaving cost can be found by taking the estimated product of one loom per week, multiplying this by the number of looms run by each weaver, and calculating the cost per pound from this amount and the weekly wages.

Thirds yards per day = 180 yards per loom per week, or 1,440 yards per weaver per week. $11 (weekly wages) ÷ 1,440 = $.00764 per yard. $.00764 × 5.10 (yards per pound) = .0390 cents per pound of cloth. Adding the expense of the help outside the weaving, which averages about 30 cents per loom, or .0085 per pound, the combined cost is as follows:

Cotton	per lb.	.2400
Yarn labor	per lb.	.0600
General expenses	per lb.	.0540
Weaving and oversight	per lb.	.0475
	per lb.	.4015

.4015 ÷ 5.10 = .0788 cost per yard.

Allowing for profit for the mill brings the cost per yard up to 9 cents, which would be the selling price of the cloth.

Publico.

Piece Work System on Underwear.

Editor Textile World Record:

In looking over the Textile World Record for July we notice an article by "Madison" on Piece Work System on Underwear. This article states that it would be a good plan to have each check numbered. It seems to us that if each check was numbered it would take but a short time for the numbers to get so large that it would be almost impossible to print them on a check. For example, take a mill making 600 dozens per day, in a month's time the numbers would run up to about 15,000. We should like to hear from you regarding this. Wayburn (1209).

The numbers need not run over 1,000, which, by using letters in combination with figures and checks of different colors, should be high enough for the largest mills. As an illustration let us take a mill turning out 1,000 dozens per day. We will start off by using a white check and numbers from 1 to 1,000, which would cover a day's work. The second day would be covered by numbers, A1 to A1,000; third day, 1A to 1A000; fourth day 10A to 10A00; fifth day, 100A to 100A0; sixth day, 1000A to 999A. By using all the letters the white check would last 26 weeks.

These combinations can be used in the same way on checks of different colors.

When the colors give out, different styles of type and printing inks of different colors may be used. Combinations could easily be found to run a mill 10 years without going back to the first check. A complete set of numbers should be ordered on each color check. When the white checks are used up the manager should find out how many stubbs of this shade had been returned to the office and how many dozens of goods with checks of this color had been boxed.

If the count did not tally he should take an inventory of all white checked goods still in process and thus determine how many checks were strayed or stolen, and how far along the check had gone in the process of manufacture before it dropped out of sight.

A manufacturer who carries out this system faithfully will know what becomes of his checks, where his goods are, whether any goods are being lifted, and how far they had gone before dropping out of sight.

Madison.

Tops on Hosiery.

Editor Textile World Record:

Can rib tops for cheap grade socks, 84 needle goods, be sewed on? We have modern machines for knitting, but have trouble in getting the work done satisfactorily.

Please state if this is ever done and what class of sewing machines will be required.

Marcellus (1205).

Tops are often sewed on in making this class of goods. For all cheap 76 and 84 needle goods selling at 60 to 70 cents per dozen it is necessary to sew on the tops in order to cut down on the cost of production. In most cases the toes are also sewed in place of looping. By this method it is possible to reduce the cost from 4 to 6 cents per dozen. However, on the better grades of work it is not advisable to sew on the tops, as it is impossible to get as smooth work as is obtained by transferring. The Union Special or the Singer machines, or in fact any of the standard makes of sewing machines, can be used successfully. Merrill.

Wet Twisting.

Editor Textile World Record:

In running 2/60s and 2/80s combed peeler yarns on wet twist, how many spindles do they call one side?

How many sides does one twister tender keep up?

Do they do their own cleaning, such as wiping ring rails and oiling them, or do they have help?

What do they use as a lubricant for wet twister ring rails?

How is it applied, and how often?

Should the ring rails be boiled to clean them and how often?

Should the top brass rolls be boiled to get the dirt off, or is there a machine similar to a burning down lathe used by roller coverers, for cleaning them with sand paper, or any other method? Is there a polish that can be used to clean the rollers thoroughly? If so where can it be purchased?

How deep in water should the yarn be run? Should the frame be stopped to doff?

Should the frame be stopped to creel? How often should the water in pans be renewed? What is done with the seconds in fine yarn mills?

What speed should twister rollers run on 2/50s, 2/60s and 2/80s? What size of rings are used? What sizes and make of travelers are best for the above numbers? What kind or wind is best to use, warp or filling?

How ofter should the ceiling and pulleys be brushed down? Should the frames be stopped while doing this? Also, is there any way to brust down except by a broom or long pole? If so how done?

Bigelow (1203).)

In twisting 2/60s and 2/80s yarn every detail that will insure cleanliness of product and reduction of waste should be carefully looked after. It is essential that the yarn should be kept free from oil spots and present a clean, smooth, white appearance. Nothing detracts so quickly from the sale of fine yarns as a profusion of oily spots and large, dirty knots.

A good hand will run from 12 to 15 sides and should take care of the cleaning of the frame, that is the wiping of the fly, dirt and grease, from the frame, the rails and the rolls. The frame should be wiped two or three times a day and the creel kept from accumulated fly as this may from time to time catch on the yarn, as it is being twisted, and thus be incorporated in the finished product.

The number of sides a hand will take care of depends upon his efficiency and the number of spindles on a side. For instance, a hand can take care of more sides when the frames have only 120 spindles, or 60 spindles on a side, than when the frames have 240 spindles each, or 120 spindles on a side. On numbers mentioned above, the frames should not be less than 200 spindles each. The hands are paid from 10 to 15 cents a side, depending upon the number of sides run and the number of spindles on a side. Sometimes the doffers are required to help clean the frames.

The oiling should be done by one man whose entire time will be taken up by this work and other of like nature. He is held responsible at all times for the proper oiling of all the parts of the frames. The spindles need to be oiled every two or three weeks, pulleys, cylinders, gearing and rolls every day, while the slower moving parts can be oiled once a week. It is not a bad idea to have the cylinder bearings oiled twice a day except on frames that have self-oiling boxes. As a part of the oiler's job, except where the amount of work is already all he can attend to, he should keep the ceiling and pulleys brushed down. Do this once a week. A long pole with a broom nailed to the end is used and found very serviceable and convenient and about as good as any other arrangement tried.

The hangers are usually wiped off with waste, using a light ladder to reach them. This is done once a week. The counter belts are cleaned once a week and greased occasionally. A convenient way of cleaning them is to take a piece of card clothing on flat board and nail this at a slight angle on the end of a pole so that the face of the clothing can be easily held against the inside of the belt while running. If this is done lightly once a week and the belt greased occasionally they will last longer, do better work and prevent slippage. This work should be done while the frames are stopped for the regular Saturday morning cleaning. With proper thought and care a good oiler will so arrange these different jobs that he will get around to all in the required time and keep everything going smoothly, one

thing following another in regular routine. Do not make the mistake of getting anybody to do the oiling, as this is of no little importance and unless carefully looked after will result in a great deal of damage and bad work.

The top brass rolls are kept fairly clean by the movement of the yarn and seldom need any regular cleaning. The top-roll pivots become gummy and should be wiped off about once a day. At the same time the brass bearing surface of the roll can be wiped off. This is about all the care that is necessary. The bottom rolls need cleaning and this is considered extra work. It is done every two or three months, usually while the frame is shut down during the dinner hour. Lack of care in oiling the bottom roll will cause it to become dirty at each roll stand. If oil is used only a little at a time should be put on. I have found the use of some heavy grease better than oil; it has not the tendency to run that oil has and it lasts longer, requiring less attention. Any one of numerous cleaning preparations may be used for this purpose. The sole object is to get a preparation that will quickly and thoroughly clean the brass roll and at the same time not scratch it. Any mill supply house can supply the wants in this line.

The ring rails and rings should receive special care and attention. The rings should be kept oiled so that there will not be so much wearing and cutting of the travelers and breaking of the ends. Some prefer oil as a lubricant for the rings, while others prefer grease. The idea is to get some substance that will thoroughly lubricate the rings and not have a tendency to spread or blacken the yarn. Non-fluid oil is a good grease to use on rings, and lasts for some time. A little will do more good than a large quantity and it does not have the tendency to smear the yarn as some others I have tried. The rings should be greased with this preparation about twice a day, putting just a little on the inside of the ring near the bottom. In using oil it will become necessary to do this oftener.

It is not necessary to boil the ring rails to get them clean as this is too cumbersome and troublesome. Soak the rails in a strong solution of soda ash for a few minutes and then wipe off with waste. This will do the work thoroughly and quickly. Another method often used is to clean by using a jet of steam. This loosens the grease and wiping will remove it easily. In either case the rails are taken off the frame and put in a trough made for the purpose. The frequency of cleaning will depend upon the lubricant used, as oil tends to spread and collect dirt and fly quicker than grease. When oil is used on twister rings, it usually necessitates cleaning oftener. Using non-fluid oil, I have found that twice a week is often enough to clean the ring rails. This will keep them in excellent shape. Often they are cleaned only once a week and the yarn keeps clean.

The object of the water is just to wet the yarn and it makes no special difference how far the yarn goes under the water. Set the guide rod down to the bottom of the pan and keep the water up over the top of the rod. This is as good a method to follow as any. As the water in the pans collects fly and dust, it is a good plan to let all the water run out, wipe out the pan with waste, and fill with clean water. To get the best results this ought to be done every day, but is often not done but once a week.

It is necessary to stop the frame while doffing. The doffing mechanism is similar to that on the spinning frames and should be done in about same way. The frame is stopped while creeling. The spools will commence to run out at about the same time and they should all be taken out and new ones put in. This saves seconds, waste and loss of time. When twisting is done from tubes that have been wound double this is not essential, but even then is the better arrangement. The seconds in fine yarn mills are disposed of to the best advantage in any way that comes up. It is hard to get rid of them, especially on a dull market.

The question of speeds is rather hard to answer definitely. The speed of front rolls

on twisters depends upon the size of the roll, the amount of twist put in the yarn and the speed of the spindles. The speed of the spindles on 2/50s and 2/60s will be from 7,000 to 7,500 r. p. m. and on 2/80s it will be 7,500 to 8,500 r. p. m. The size of the ring used is 1 3/4 inches for 2/80s, 2 inches for 2/60s and 2/50s yarn. The size of the ring used may vary, as some will use the 1 3/4-inch ring for 2/60s, but the sizes given are about right.

The size of travelers cannot be definitely stated. It depends upon the condition of the rings, the speed of the spindles, the size of the bobbin and ring, the length of traverse and the amount of twist. The best way to determine this is to get samples of several sizes and try them on the frames under the same conditions and then decide which will be the correct size to use. The same can be said about which make of traveler. I have used several of the leading makes and find them all good. Most of the twisting is done on filling wind and is preferable in nearly every case. Steuben.

Bleaching Wool Without Costly Apparatus.

Editor Textile World Record:

How can I bleach wool without having to build an expensive plant? We have only about two tons of wool that requires bleaching each year. We have tried brimstone and it has not proved a success. We have an unlimited supply of good, clean water. Lakewood (1210).

Judging from your inquiry I presume "Lakewood" requires the bleaching of only a few lots of wool during the year, and that he is not equipped with "stoving" room and the necessary apparatus for the use of fumes of burning sulphur. Instead of using the gaseous method with brimstone, however, it is possible to obtain a good bleach on wool by the use of solutions of sodium bisulphite.

Before the wool can be bleached it is understood, of course, that it must be well scoured and thoroughly cleansed from residues of soapy liquor. For the scouring of the wool use a liquor containing about 13 pounds of potash and 5 pounds of soft olive oil fig soap to 100 gallons of water. The temperature of the scouring bath should be 140° F. The wool is steeped in this liquor and worked sufficiently by poling in order to allow of a thorough scouring, but not to such an extent as to cause a felting of the wool. It should take about half an hour to scour a lot. The wool should then be forked up on to a screen over the tub, so that the soapy liquor may drain into the scouring bath. The wool is then placed in another tank containing water at about 160° F., and given a thorough rinsing to remove the soapy liquor from the fiber.

Even though good, clean water is available it will be best to guard against any possible hardness in the water, which might precipitate an insoluble soap on the wool, by adding to the wash water before entering the wool about half a pound of potash. In the absence of suitable squeeze rolls for the squeezing out of most of the soapy liquor from the wool before rinsing, it is probable that a single rinsing will not be sufficient to cleanse the wool, and a further second rinsing will have to be given in the same manner as the first. It must be borne in mind that it is very essential to get rid of all the soapy liquor in the fiber before the bleaching operations can be properly proceeded with; for if any of this soapy matter is left on the material, it will form an insoluble greasy compound which will stick in the wool very persistently and will without doubt manifest its presence later on by the appearance of various defects in the manufactured goods.

The bleaching bath with sodium bisulphite may be prepared as follows: For 100 gallons of cold water use 2 1/2 gallons of sodium bisulphite solution of 32° Tw. strength and 1/2 pint of oil of vitriol. The bath should be made up in a wooden tank or vat free from iron steam or water pipes. The scoured wool is introduced into this cold bath and worked slightly at first in order to establish even and complete impregnation of the fiber. It is then allowed to steep overnight underneath the solution. In the morning the wool is taken out and allowed to drain. It is then rinsed thoroughly with fresh water until all odor of brimstone has disappeared from the material. If desired the wool may be tinted

in order to obtain a purer white. For this purpose, for 100 pounds of wool, use 1/4 ounce of alkali violet 6B; dissolve the dyestuff in a bucket of hot water and filter into the bath through a piece of cotton cloth. The wool is steeped in the tinting bath for 15 minutes at about 100° F., and worked gently in order to obtain an even penetration of the tint.

If it is found to be difficult to remove all the sulphur smell from the wool in the first rinsing bath, it is well to add a small quantity of oil of vitriol to this bath so as to decompose any residual sodium bisulphite which may still remain in the fiber.

The sulphur bleach on wool is an effective and cheap method of bleaching, and is very largely employed even at the present time. It has, however, some disagreeable features. In the first place it takes a rather long time to accomplish the bleaching; secondly, it is rather difficult to remove all trace of sulphur compounds from the fiber except by repeated rinsings and the consequent use of a large amount of water. The complete neutralization of all of the sulphurous acid in the wool may be quickly accomplished by the addition of a small quantity of potassium permanganate to the rinse bath. This, however, requires a delicate adjustment as to the exact amount of potassium permanganate to use; if even a slight excess is used a brown stain will be formed on the wool, and its use for this purpose is therefore not recommended except in the hands of an experienced operator. The sulphur bleach on wool is also not a very permanent one, as the yellow tint of the fiber shows a tendency to reappear after some time on exposure to the air.

Another method for the bleaching of wool is by the use of sodium peroxide or of solutions of hydrogen peroxide. This method of bleaching is more costly than the bisulphite method and the preparation of the bleaching vat requires more experience. It also requires a specially constructed tank with lead pipes and consequently would not be suited to the equipment of this special inquirer.

Another very effective method of bleaching rapidly small lots of wool is by the use of potassium permanganate. For 100 pounds of wool which has previously been thoroughly scoured as already outlined above, use about 400 gallons of water and one pint of oil of vitriol and add 3/4 pound of potassium permanganate previously dissolved in a bucket of cold water. The bath is operated cold. The wool is introduced and poled for 15 minutes. It is then lifted out and drained, and put into a fresh bath containing 1 1/2 gallons of sodium bisulphite solution of 32° Tw. strength, and worked gently. When the wool is taken out of the permanganate bath it will be of a brown color, but this is completely removed by the bisulphite bath and the wool comes up a good white. After coming from the bisulphite bath the wool is well rinsed in fresh water. For the purposes of bleaching wool on a small scale this permanganate method is very good and economical. The bleach obtained is also permanent and without any bad features except, perhaps, that it causes the fiber to be a little harsh. This is especially true if too much permanganate is used, or if the wool is left in this bath too long, or allowed to stand too long before treatment with the bisulphite. The latter bath is simply for the purpose of removing the brown deposit of manganese compound, and the amount of the bisulphite may be so adjusted as to be just sufficient to remove the brown stain. Howell.

Prices Paid for Winding Yarn.

Editor Textile World Record:

Can you tell us what the average piece price is per 100 pounds for winding 2/16 and 2/26 worsted and 2/20 wool from skeins to 17-inch bobbins?
Lawrence (1177).

The price per 100 pounds for winding 2/16 and 2/26 worsted and 2/20 wool from skeins to 17 inch bobbins would be: 2/16, 50 cents; 2/26s, 67 1/2 cents, and 2/20 wool, 45 cents. Laramie.

Switzerland leads in the value of laces imported into this country, with $12,591,620, or more than one-third of the total, and is followed by France with $9,125,671.

Pressing Half Hose.

Editor Textile World Record:

Kindly give us some information on the pressing of men's mercerized half hose, and particularly the method used in retaining or adding to the high luster. Canton (1207).

There has been much discussion of this question. Builders of different presses maintaining that the best results can be obtained by the use of their respective machines. Some manufacturers use the hot, hollow plate press, some, the roller press; others, the cold plate press; and others the steam, paper press.

In my own experience I have been able to secure a better luster by the use of the hot press. At the present time we are pressing the goods first on the roller press, then pressing them the second time on the hot, steam paper press at a temperature of 155° to 165° F. It is important to keep the press at a uniform temperature, as I have found that too much heat has a tendency to bake the goods, giving them a hard and dead finish. The best results are obtained at about 160 F.

The luster of the goods is sometimes lost by the action of the dye. I have found that the dyeing process has more to do with the finish of the goods than the pressing. The luster once destroyed in the dyeing can never be restored by pressing. There are also numerous other conditions which affect the luster to a great extent, such as quality of yarn, twist and tension and gauge of goods. The three grades of mercerized yarns most generally used at present are combed peeler, combed Egyptian and combed sea island. Of these grades the combed peeler is the cheapest and will show the poorest luster. The combed Egyptian is the medium grade and the one most used. This grade will give a better finish than the combed peeler. The combed sea island is the best grade, having a long staple and gives a much better luster than any of the other yarns. It will also be found that a hard, twisted gassed yarn will give a better finish than a soft twist. The goods will be much smoother, as there are no loose fibers. The knitting also has much to do with the finish, and a firmly knit hose will take a much better finish than a fabric loosely knit from the same yarn. In order to obtain the best possible results I would advise the use of mercerized combed sea island yarn with a very hard twist, knit quite firm, dyed with developed black, and pressed first on the roller press and again on the hot press at a temperature of 160° F.

Merrill.

Streaks on Knit Goods.

Editor Textile World Record:

Enclosed find sample of bleached knit goods with yellow streaks. Could you inform us the cause of these yellow marks, which has given us considerable trouble during the hot weather?

In our bleaching process we boil out with caustic soda and bleaching assistant and use chloride lime in bleaching and sour with oil or vitriol. We then soap with chip soap, but the yellow marks will appear whether we use soap or not. We dry and roll the goods on what is called the Murphy dryer, putting the goods on wool covered pipes damp and blowing hot air through the pipes drying the goods while they are rolled up.

Wayburn (1206).

The stains on the sample of knit goods are what is called "air stairs." These stains appear more often in hot weather than in cold. If the goods are left in a damp condition in a hot room, or when they are exposed to hot air and left in a pile, the streaks will often appear. If the goods are dryed up every night no difficulty will be experienced.

The system of drying that "Wayburn" explains is a very good one and I feel confident that the streaks are not caused by this process. If there are any goods lying in the wet state during the night or week ends, examine them carefully next morning and you will notice the yellow streaks around the overhanding laps. These can be taken out by pouring boiling water on them through a fine spray or garden hose. If this method does no good or if the stains are heavy the goods will have to be given a sour bath.

I have had this same trouble in the hot weather and find that by covering all the wet goods that have to lie over night with wet cloths. If we have any lying in the white piles we cover them over with sheets and give them a good bath with the hose three or four times each day.

Delco.

Knitting Department

THE KNIT GOODS SITUATION.

At the present writing, the selling season for spring of 1911 is in full blast and considerable activity is evident about the primary market. Practically all of the larger operators and a great number of the smaller buyers have been, or are now in New York and while we have yet to learn of any lines being entirely sold up and withdrawn from sale, enough business has been placed with several manufacturers to cause them to feel well satisfied with the progress as far as the selling is concerned. Some anxiety is now being exhibited with regard to the ability of the manufacturers to turn out the goods at the prices they are sold at.

Certain it is that the bulk of the selling so far done has been just so much speculation. From all we can learn, the prices have been placed on the goods on a basis of 11 to 12 cent cotton. Whether the raw material will go to that figure when the new crop makes its appearance is a matter of much concern to manufacturers who have their order books filled.

The yarn spinners have curtailed their production to a considerable degree during the past two months and manufacturers cannot hope for lower prices on yarns by reason of any surplus in the market. The chances for lower prices on raw cotton are slim, if the government reports on the condition of acreage are to be taken as a guide.

In our last issue we spoke of very slight advances over last year's prices that are being asked on various lines of men's 25 cent balbriggans, but we have reason to believe that since then even those close prices have been shaded to secure certain orders.

One new line of men's 25 cent balbriggans in the field this season is that of the Morris Mills. They are showing a garment weighing about 4 1/2 pounds at $1.85 and this has been well received by many buyers. These people have recently built a new mill called their No. 6, and it is understood that a good share of the production will be on 25 cent balbriggans.

Since our last writing there has been a little softening of Egyptian yarn prices and as a consequence one large Philadelphia manufacturer has shown four numbers of balbriggans made of pure Egyptian, as follows:

4½	pound at	$3.70
5	pound at	$3.85
5½	pound at	$4.00
6	pound at	$4.15

These prices carry a single seated drawer and this manufacturer gets 20 cents additional for double seat.

Orders on men's combination suits for 1911 are being placed very freely. The Cooper Mfg. Co. have notified the trade that they will discontinue the making of their $7.50 line. This has had the effect of causing the buyers to shop about somewhat more than usual.

There are a number of lines of men's suits being shown by Eastern manufacturers, but in most cases only a number or two are shown by each maker along with other classes of underwear. If the buyer wishes to go through a fairly complete line from any one maker, he must turn to the Ohio manufacturers, most of whom are located in Piqua, and from them he can buy a line of combed cotton goods in peeler, white or ecru at $7.00 to $7.25; lisles at $10.00 to $12.00 and mercerized goods from $14.00 to $16.50.

The business on nainsook shirts and drawers for men seems to have reached its limit and from what information we can obtain, manufacturers of this class of goods with one exception are anxious for business. During the season just past a number of lines were sold at prices which permitted their sale at retail at 25 to 38 cents per garment, but the widely advertised line at 50 cents has had the call. Even on this line the shirts and drawers have not been in as good

demand on account of the increased call for the combination suits.

In a measure the same conditions exist on mesh lines. Those that reached the retailers for two or three shilling numbers have been taken fairly well, but the great demand was for the widely advertised brand at 50 cents, which clearly demonstrates the value of persistent advertising. That the manufacturers of this line have faith in its value, is evident when it is reported that they have a contract to spend in the neighborhood of $400 a night for an advertisement on an electrical advertising device on Broadway in New York City.

Among the specialties being shown in knit underwear, enjoying a goodly measure of success, is a drawer made by the Wonderwear Co. of Utica. As its name implies, this garment embraces a feature which assures the wearer extra wearing quality. It consists of a double seat, not sewed on as the double seat is usually put on, but four extra threads are knit into the garment, much the same as a spliced heel is knit into a stocking. These get to the retailers for 50 and 75 cents and $1.00 They are planning to put the suits of the same qualities on the market at from $1.00 to $2.00 a garment.

HOSIERY.

Although the orders so far placed on hosiery are not as large in proportion as for underwear, yet there are several manufacturers who claim to be in a position so that they can run for some time on what they have already sold In fact, a few of them state that the raw material conditions are such that they do not think it advisable to urge the sale of their merchandise to any great extent.

Many buyers have been in the market and while it is conceded that the individual orders placed are somewhat smaller, the aggregate business amounts to a goodly volume. Unless there is a decided reduction in the price of cotton before it becomes time to make the goods, manufacturers would be better off without any orders, as it is said that the prices being named appear to be based on cotton in the neighborhood of 10 cents.

The demand for spot goods during the past month has been heavy and some lines has demanded a premium.

Plain colored goods at all prices are scarce, and it is noticed that there is quite a heavy call for white.

The demand for silk hosiery continues and manufacturers are nearly three months behind on their orders. Silk hosiery seems to have become a staple line on account of the low prices at which they have been sold.

A few of the better grades of embroidered goods are selling freely in the large cities. These are very light in weight, taken mostly in black with colored figures.

The low priced half hose market is in a somewhat chaotic condition on account of the extremely low prices. It is claimed that half hose of good weight and gauge, dyed black and put up in boxes, may be had as low as 55 cents per dozen, but it is hard to figure out a profit to the mill making such merchandise.

Some very handsome lines of lisle thread goods are being shown at $1.65 and up, and a heavy business is being done on silk half hose at from $3.37½ to $3.62½. Some manufacturers are going into making these goods in a wide range of colors, made of tram silk with lisle tops, heels and toes, and those buyers who have been in the market have placed orders very liberally.

FANCY KNIT GOODS.

Under this head we may speak of the knitted shawls which are beginning to return to popular favor. It is predicted by many that the knitted garment is in a fair way to take the place of the cashmere shawl with the majority of the American women. In the fashion centers of Europe, high colored cashmere shawls are being freely worn, draped loosely about the figure and serving the purpose of a mantle. Some very attractive novelties in the way of shawls trimmed with fur are being shown, and it is predicted that these effects will be shown by domestic manufacturers in knit shawls very soon.

The sweater business continues in good volume. The knit coat now seems to be a necessary part of every lady's traveling out-

fit and those who once become accustomed to this comfortable garment for boating, motoring, golfing and other outdoor exercise will continue its use.

Quite a business is now being done on imported sweaters, more especially those made of angora wool, which come principally from Austria. It is said that many domestic manufacturers have attempted to duplicate the yarns used in these foreign garments, but as yet have been unable to do so.

FULL FASHIONED KNITTING.

BY PAVONIA.

(Continued from June.)

Fig. 47 shows the pair of cams which move the cam-shaft when the fashioning takes place. As can easily be seen they are intended for a side thrust. Fig. 8 shows them on the long cam-shaft at 3a and 4a.

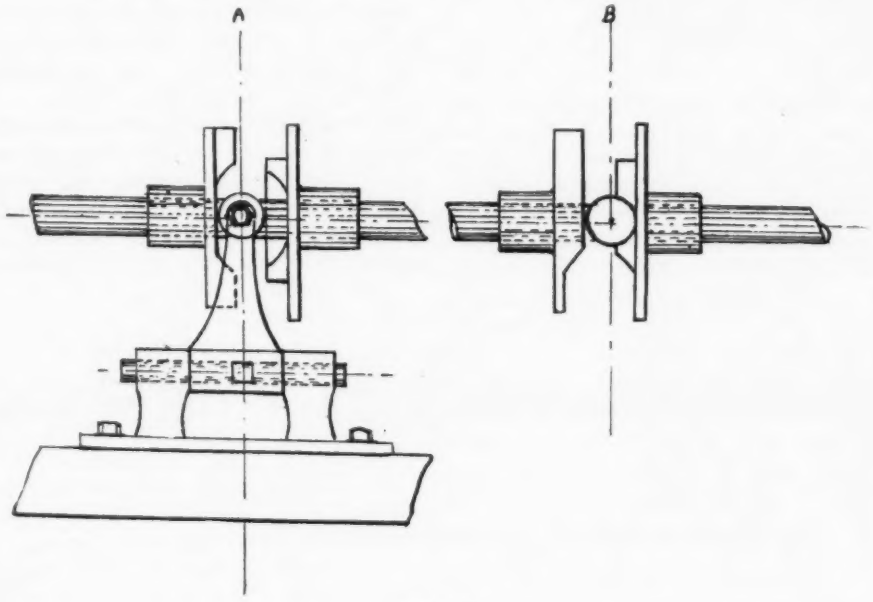


FIG. 47.

These cams each have a separate path for a roller, one on the left edge and the other on the right edge.

On most modern machines the edge of the smaller cam changes the shaft over from knitting to fashioning, and a large one brings the shaft into position again for knitting. Fig. 48 illustrates this shogging device, as the cam moving arrangement is called, applied to one of the most successful Cotton machines for full fashioned underwear. The shogging device, or rather the two cams and the roller arrangement, is almost exactly the same on any Cotton machine, but the method of operating this shogging mechanism varies widely.

The device shown in Fig. 48 can be so adjusted as to cause the shogging apparatus automatically to move the cams over after each course of knitting by a ratchet. Two more courses can be knit between the periods of shogging.

On most machines used in America the shogging is controlled by a pattern chain on which are fastened at necessary intervals protruding pieces which insert themselves successively under the lever on which the shogging roller runs. A general outline of this arrangement is shown at Fig. 49.

When making underwear, especially union suits and other large garments, the wide and narrow portions of the work are by no means uniform in number or regular in the

distances between each fashioning. This prohibits the using of any automatic measuring arrangement, or the adoption of a special pattern device. The shogging in consequence of these difficulties requires constant attention on the part of the knitter, for he

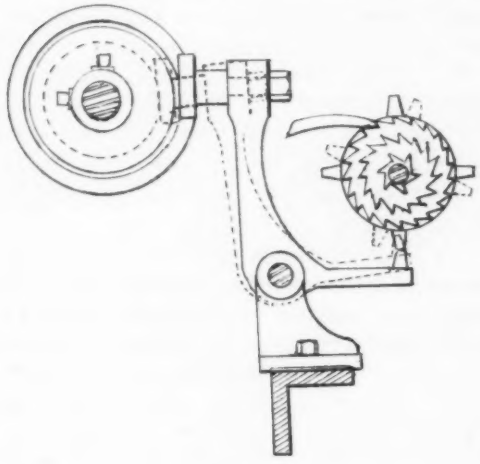


FIG. 48.

must start the mechanism by first choosing and putting into action the proper ratchet, which, in knitting many of the runs of fashionings, must be changed to others if the most perfect shaping is to be made. The sizes, shapes, widths, number of narrowings and the many varieties of garments that are made on a full-fashioned underwear Cotton frame tend to make self-acting and self-changing devices too complicated, so the responsibility for correct shaping to a great extent rests with the knitter who must make the necessary changes by hand.

If one garment is to be made continuously on one machine without many changes, there are many automatic pattern devices which can be successfully used. The arrangement shown at Fig. 48 is used for tights, combination suits and all general full fashioned knit underwear on account of its adaptibility to all varieties of shaping without changes in its makeup, other than to put into or out of action the different ratchets by which it is operated.

On hosiery machines this pattern arrangement is made to work automatically, because as a rule the product is uniform, and scarcely any changes are necessary. It is on this class of machines that a chain such as is shown in Fig. 49 is used.

The shogging over of the cams is not always for the purpose of shaping. It is customary in Germany, England and other European countries to mark the sizes of hosiery by what are called "eyelet holes." These can be seen in any high grade imported goods, either underwear or hosiery. When these eyelet holes are made mechanically, the shogging movements are brought into action. The greater portion of underwear however is marked by hand, the eyelet holes being made by transferring the stitches from certain needles to the next besides them, with the aid of a small hook. All real openwork, (not tuck stitch) also requires this shogging movement, as this kind of open lace is mechanically produced by transferring stitches from needle to needle with the narrowing machine.

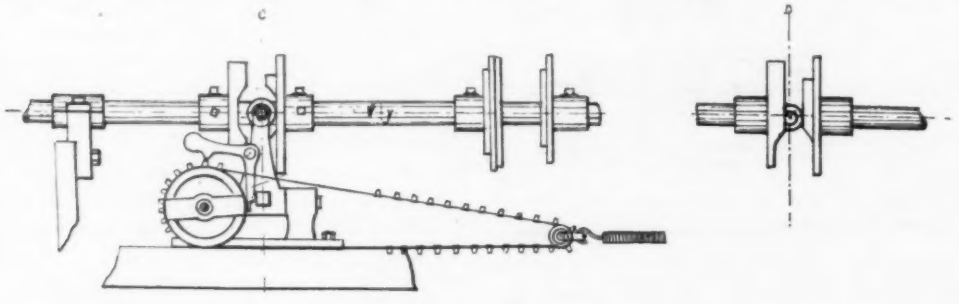


FIG. 49.

Fig. 47 illustrates the operation of the shogging cams and shows the two positions

of cams and roller. Fashioning occurs when the roller is allowed to run on the edge of the smaller shogging cam at the point A.

If the roller is then drawn to the edge of the larger cam as shown at B, the knitting cams are again brought into action.

Fig. 47, A, shows the cam shaft in the fashioning position, the roller having been drawn from the edge of the smaller cam.

This can be better understood from the drawing, Fig. 48. If the cam shaft continues to revolve at the point, A, Fig. 47, the shaped edge of the larger shogging cam comes in contact with the roller, and the entire shaft is moved into the knitting position as indicated by the center line, Fig. 47, B. The position B, is maintained while the operation of knitting is going on. When a fashioning is to be made, the shogging roller is allowed to fall from the edge of the larger shogging cam to the edge of the smaller one at the point, C, Fig. 49.

The shogging lever on which the roller is fastened is held in position on the edge of the larger cam by the mechanism shown in Fig. 49 or by a similar device. When the stud on the chain is inserted automatically by the movement of the chain-wheel, the roller immediately leaves the edge of the large cam and falls in line with the small cam. By a continued revolving of the shogging cams with the roller in this position, the camshaft is thrown sideways by the edge of the cam and the fashioning motion is continued with the roller in the position shown at D, Fig. 49. The entire mechanism is not shown in the drawing. There is, attached to one of the shogging cams a projecting cam which causes the shogging roller to rise and fall between the edge of the small cam and the edge of the large cam. When no bit is on the chain to cause a narrowing, and when the motion cam has brought the roller into its position on the edge of the larger shogging cam, the shogging lever is held in that position by the catch, F, Fig. 49. When the catch is not lifted by a narrowing bit, the lower end rests on the projecting piece on the shogging lever and holds the lever in a stationary attitude. This is not the case with all machines. Some of them move the roller from the edge of one cam to the other at every revolution of the cam shaft, the presence or absence of a narrowing bit on the chain deciding whether a knitting or a narrowing course shall be made.

(To be continued.)

A KNITTING MACHINE NEEDLE.

This latch needle, which has recently been patented in this country, is designed to prevent the point of the hook from being exposed in case the latch is moved from its normal position. It is made with a flat bevel on the front end of the hook, the latch having flat faces to fit the bevel of the hook. The end of the latch is made of thin material to enable the stitch to pass more freely than in the ordinary spoon shape construction. Fig. 1 is a side elevation of the improved needle; Fig. 2 shows the latch in a lowered position; Fig. 3 shows the latch in full lines in lowered position, and in dotted lines in raised position. Fig. 4 is a front elevation showing the latch moved to one side. The inventor describes the needle as follows:

In the needles now in use the latch, when moved to one side, which occurs frequently in the operation of a machine, exposes the point of the hook so that it catches in the yarn, causing imperfect work and in some instances, tearing the fabric. This needle is designed to overcome this objection by forming a flat bevel on the front end of the needle and providing a latch with a flat face fitting the bevel and of less size with respect to the point of the hook, that it can be moved to one side or the other, nearly one-half the distance of the thickness of the hook, without exposing the same to the work.

By making the end of the latch flat, it is of relatively thin material, and has but little thickness at the point of the hook, so that the stitch can easily pass when it is either in its uppermost position or its lower position.

In the ordinary constructions the latch in nearly all instances is formed in what is known as "spoon shape," the depression in the latch being adapted to receive the end

of the hook. Even with this provision, the latch can move to one side or the other by reason of the pressure of the work and in some instances is forced back of the hook.

The improved needle has the body portion to which is pivotally connected the latch and on which is the hook, the front end of the hook being flat, as at 5, and beveled, having the point, 6, as shown by Figs. 3 and 4. The latch is provided with the flattened face, 7, which is so formed with respect to the flat beveled face of the hook that the two come in contact, as shown in Fig. 1. The material composing the flat face is of comparatively thin material, so that when in position against the flat beveled face of the hook, it offers no resistance to the passage of the stitch. While in its lowered position, as seen in Fig. 2, it is in such a position and is of such thin material that the stitch slips off very easily.

The width of the flattened face is such that there is an extension on each side of the point, 6, when the said face is in proper position against the flat beveled face, 5, of the hook, it being seen that by reason of this, the latch, 3, when a machine is in operation, can be moved a considerable distance either to the right or left of the point, 6, without exposing the same, so that it will be impossible for the stitch or work to be caught by the hook. By this means the objections to the ordinary construction are overcome. The flattened face, 7, of the latch is shown of such dimensions that it can be moved in either direction laterally, to a distance equal to nearly one-half of the hook end, although it will be apparent that a greater or less extent of the extension on each side of the point may be made if desired.

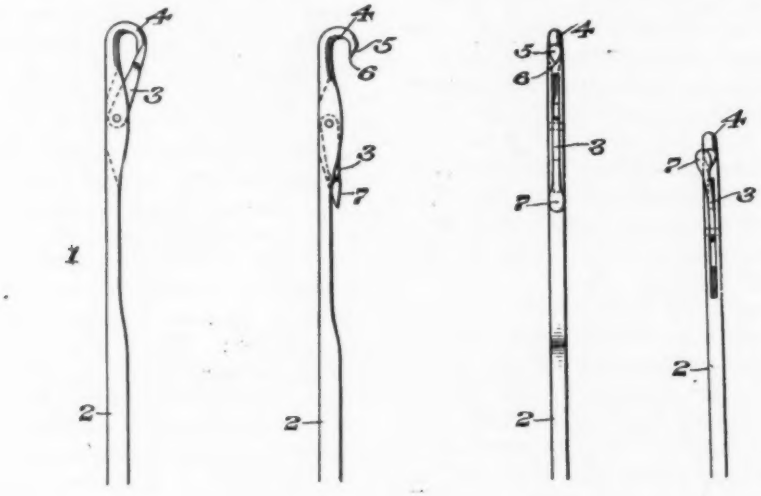


FIG. 1. FIG. 2. FIG. 3. FIG. 4.

A YARN TRAP FOR KNITTING MACHINES.

This device, which has recently been patented, is intended to prevent the slack yarn from being drawn into the stocking during the reciprocating movement of the machine. It is so located as not to engage with the yarn when the circular portion of the stocking is being knit. Fig. 1 shows a portion of the knitting machine with the yarn trap attached. Fig. 2 is a side elevation of a portion of the knitting machine, illustrating the method of operation. The trap is described by the inventor as follows:

When the machine is making circular work the parts are in the position indicated in Fig. 1, at which time the knitting yarn

passes from the bobbin through the guide.

When the machine is making the heel or toe of the stocking or similar work, the needle cylinder does not rotate but oscillates back and forth, whereupon a lever is moved toward the right so that the deflected

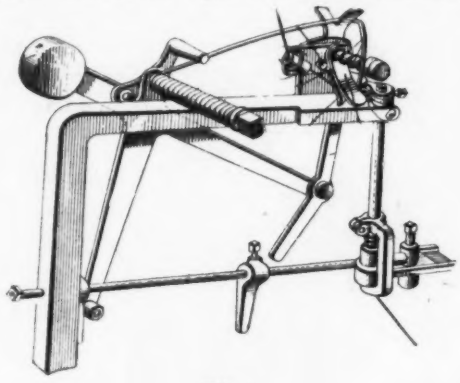


FIG. 1.

lever is disengaged from the spring, which is permitted to assume its normal position. This causes the yarn to be drawn upwardly since it passes through the eyelet of the spring and the yarn is forced between the

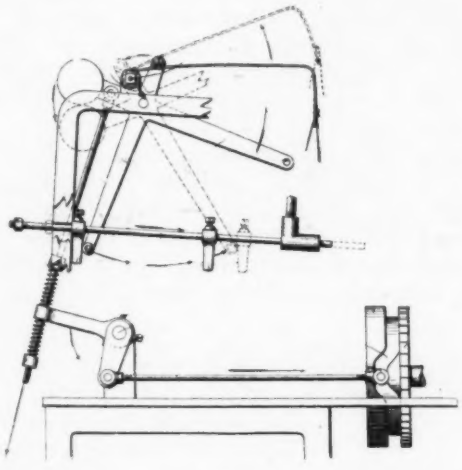


FIG. 2.

spring pressed members, so that yarn will not be drawn from the bobbin at this time. On the return movement of the needle cylinder the arm is moved to the position indicated in Fig. 1, whereupon the lever will cause the spring to be depressed and the parts will assume the position seen in Fig. 1, at which time the yarn does not engage with the presser members but passes freely to the needle cylinder.

The lever is automatically rocked when the machine changes from a reciprocating motion to a circular motion or from a circular motion to a reciprocating motion. When the lever is rocked toward the left it engages the block and causes the shaft to be moved toward the left. At such time the splicing yarn is cut off by mechanism actuated by a rod. At the same time the tension is taken from the take-up spring. It will be apparent that when the lever is rocked in a reverse direction toward the right it will engage the contact member and cause the rod and its adjuncts to be moved toward the right. The purpose of the rod, contact members and their adjuncts, is to cut out the splicing yarn when it is not desired to reinforce the fabric which is being produced.

A KNITTED SWEATER.

The object of a new construction for sweaters, recently patented, is to provide a garment that will maintain a shaped or fashioned effect without seams and without showing on the outside the means by which this effect is secured. The garment and its manufacture are described by the inventor as follows:

The garment is knit on a machine having two sets of needles to form a ribbed inner face and any suitable outer face, provided the outer face loops are substantially as elastic as those forming the rib wales on the inner face. There are then knitting into the inner rib wales at intervals, where the waist of the garment is to be, rows of tying courses to tie the inner rib wales together and limit the stretching of the garment at the waist, and without the tying threads showing on the outer face. The outer face of the garment is preferably knit of some ornamental stitch, such as "shell or honey comb stitch" or "rack stitch," but ordinary rib wales may be formed on the outer face

alternating with the rib wales on the inner face.

Fig. 1 is an outside view of the rear face of a sweater, showing a rack stitch outer face; Fig. 2 is an inner face view of the sweater, as if turned inside out; Fig. 3 is an

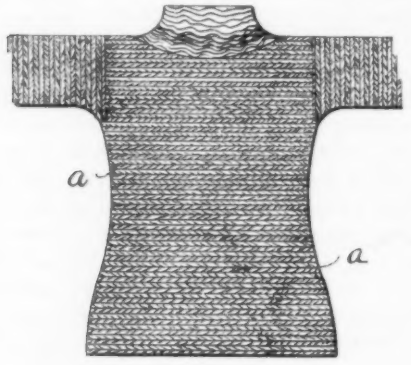


FIG. 1.

enlarged section of a part of the fabric, showing the manner in which the tying courses unite the inner rib wales.

In the construction shown in the drawings, the sweater consists of a single flat knitted web made into a sweater without side seams. The outer face of the knitted fabric is knit with elastic rack stitches, a, while the inner face is knitted with vertical rib wales, b, these two styles of stitches being of about equal elasticity.

When in the course of knitting the web for any given garment the waist line of the garment is reached, there are knit into the inner rib wales only, at suitable intervals, courses of tying threads, using for this purpose only one set of needles which form the rib wales on the inner face of the fabric, while the needles carrying the loops of the outer face are temporarily held out of action. These tying courses, indicated at t in Figs. 2 and 3, are thus in effect plain courses knit into the rib wales only, the sinker wales of the plain knitting loops extending across between the rib wales on the inner face of the fabric, and thus limiting the natural elasticity of the fabric due to the use of the rib wales. In consequence, the finished garment is not capable of being stretched so much at the waist line as at the other parts of the garment and therefore the sweater will have a "fashioned" effect, though made of a seamless web, and will maintain its

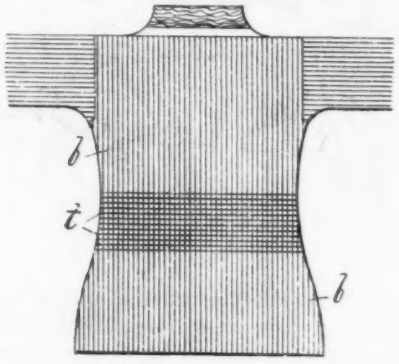


FIG. 2.

shape notwithstanding the stretching and rough usage to which such a garment is usually subjected. Owing to the fact that these tying courses are knit only into the inner wales, they will not show on the outer face.

The different parts of the web for the different parts of the sweater (breast, waist, hips) may be knit of varying weights of yarns and of varying degrees of tightness or looseness. Thus the whole waist line may be knit tight, while the breast and hip portions may be knit loosely. Thicker or more elastic yarns can be used for the breast and hips than for the waist.

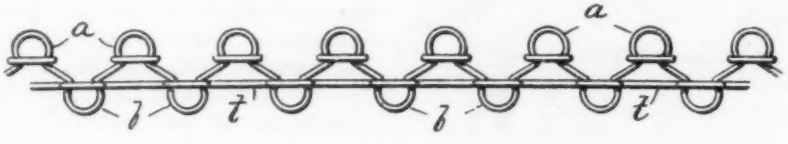


FIG. 3.

The production of cotton in Russia in 1909 amounted to 720,000 bales of 500 pounds each.

A STOP MOTION FOR CIRCULAR KNITTING MACHINES.

A knitting machine stop motion, recently patented, is illustrated at Fig. 1, which also shows a portion of a circular knitting machine in perspective.

Mounted upon a stand in the usual manner is the sinker-burr, to which the yarn is supplied from the stationary thread-guide.

In advance of the stationary thread-guide is a movable thread-guiding finger, pivoted on a supporting bracket fixed upon the stand and having in its inner end a thread-receiving eye, the thread passing to the eye from the fixed eye located somewhat above the pivot of the finger. So long as the thread remains under tension, the inner end of the finger will be supported in a raised position, as shown by solid lines in Fig. 1. When, however, the tension on the thread is relieved, as by the breaking of the thread, the finger will at once drop to the position indicated by the dotted lines.

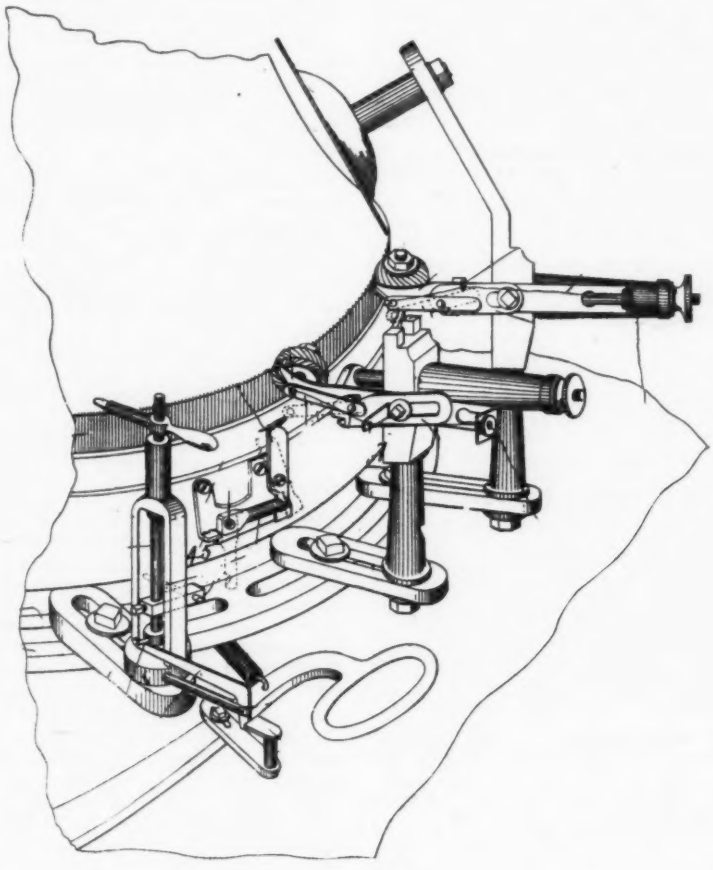


FIG. 1.

In advance of the first stand is another stand, mounted upon a ring by means of a link, upon which stand is supported a bur-wheel, of the ordinary type, as for example, what is known as a backing-wheel for supplying to the needles a backing yarn, or thread, in the manufacture of plush knitted fabrics.

The yarn is supplied to the wheel directly

from the stationary thread-guide. In advance of the stationary thread-guide is a movable thread-guiding finger, pivoted upon a supporting bracket, fixed upon a stand, and having in its inner end a thread-receiving eye, the thread passing to the eye from the fixed eye, which is so located that so long as the thread remains under tension, the inner end of the finger will be supported in a raised position, as shown by the solid lines in Fig. 1. When, however, the tension on the thread is relieved, as by the breaking of the thread, the finger will at once drop to the position indicated by dotted lines.

In the operation of the machine, should a thread break, the movable guide-finger for the thread will at once drop into the path of the latch and operate to release the trip, which is carried by the movement of the cylinder into engagement with an arm serving to rock the spindle in substantially the same manner as the same would be rocked by the engagement of the detector finger with a defect in the web.

KNITTING MILL NEWS.

New Mills.

*Indiana, Richmond. Building permit has been issued to the Richmond Underwear Co. for the erection of a plant on North 10th St. The cost will be approximately $40,000. Contract for construction work has been awarded and calls for the completion of the building in 90 days. L. M. Flesh, E. A. Todd and H. E. Sims of the Atlas Underwear Co., Piqua, O., own the new company.

Massachusetts, New Bedford. A new knitting plant has been started at New Bedford by Geo. C. Hatch, Jr., under the style of the Mishaum Knitting Mill. Four knitting machines and 1 sewing machine are being operated on men's half hose, using 2/36s to 2/45s yarns. Steam power is used and the product is sold direct. Later it is planned to equip a dyeing department.

*Michigan, Saginaw. Max Almquiest heads the Sanitary Hosiery Co., which is equipping a plant in Saginaw for the manufacture of seamless cotton hosiery. This is the same project reported last May from Muskegon. At that time Halfden Ecktell headed the company, but he has nothing to do with the project at the present time.

*New Jersey, Paterson. Hugo Huettig and Victor Opitz compose the new firm of Hugo Huettig & Co. who have established the full fashioned silk hosiery plant in the Hall Mill. Mr. Huettig was, as noted previously, secretary and superintendent of Paul Guenther, Inc., of Dover, N. J. Mr. Opitz was foreman of the plant of Paul Guenther, Inc., and was previously employed by the McCallum Hosiery Co. of Northampton, Mass. The machinery has been imported from Germany and is partly in operation. The report that Mr. Huettig's brother was interested in this company is incorrect.

New York, Brooklyn. A plant has been fitted up at 773 Herkheimer St. by the New York Knitting Co. and a line of cotton seamless hosiery is being manufactured.

*New York, Falconer. The Chautauqua Knitting Mills Co. have finally decided to locate in Falconer. As noted some time ago, this company was formed by P. A. Barrett and A. E. Williams. At first only about 4 machines will be operated.

*Pennsylvania, Fleetwood. The Ritter Hosiery Company, with Frank Ritter as president and general manager, is one of the new concerns recently started in this town for the manufacture of 200-needle half hose, of cotton. The plant contains 12 latch needle knitters, 2 ribbers and 1 looper. The production is sold through George C. Hughes, New York.

*Pennsylvania, Hamburg. S. D. Bausher has started another plant under the name of Gotham Underwear & Bleach Works, No. 2, in the former Keystone Mill and is operating 15 knitting machines and 27 sewing machines on ladies' shaped ribbed goods and straight vests, also bleaching, etc. The plant is in charge of Larue Miller.

Pennsylvania, Mountville. Parties from Philadelphia and Lancaster will start a plant for the manufacture of women's ribbed underwear in Mountsville, a short distance from Lancaster. The equipment for the mill, which will be run by electric power, is now being purchased and it is the expectation of the parties interested to have it in operation during the early part of the coming fall.

Pennsylvania, Philadelphia. Simon Abrahams, William Abrahams, N. E. Kahn, Jos. M. Kahn and Leo Bernheimer are the incorporators of the Quaker City Mills, for which a charter is now being asked. This concern as previously mentioned by us will be located at 13th and Hamilton Sts., where they will equip a plant for the manufacture of sweater coats. The number of the machines the company will operate or the date on which manufacturing will begin have not been learned. The equipment, however, has been ordered and it is expected that the plant will be under way during the coming fall. The Messrs. Abrahams are well known as manufacturers of uniforms, having been in that business for many years.

Pennsylvania, Philadelphia. Full fashioned silk hosiery will be manufactured by Joseph Haines, Jr., of Somerton, who has leased a floor in the Cope Mills at Wayne Junction. The plant will contain one set of full fashion machines, as a first installation, which have been ordered from the Textile Machine Works of Reading, Pa., and are

expected to be in operation on or about the 1st of August next.

*Pennsylvania, Philadelphia. The Riehm Knitting Mills, Inc., which recently started up with a capital of $10,000, George J. Riehm, president, and Harry J. Conlon, treasurer, superintendent and buyer, have located their plant in a portion of the Frankford Hosiery Mills at Adams and Unity Sts., Frankford, where they are installing 15 round frames and 10 sewing machines, which they will operate on woolen and worsted sweater coats, the production to be sold through John J. Quinlan, New York.

Pennsylvania, Philadelphia. A plant for the manufacture of sweater coats has been started up at 26 North 3d St. by Harry Richter, who has installed two body frames and two sleevers and four sewing machines, which he is operating by electricity and selling the production direct.

*Tennessee, Cleveland. The new Weiss Hosiery Mill is now in operation, with equipment of 50 knitting machines, 12 ribbers, 10 loopers and a dyeing plant. This concern was incorporated last December with capital stock of $25,000 and will build a small plant 50 by 150 ft. for making men's and women's hosiery from combed peeler and mercerized yarns. C. H. Weiss is president and superintendent and P. B. Mayfield is treasurer.

Enlargements and Improvements.

Canada, Ontario, Hamilton. Extensive enlargements are to be made in the capacity of Princess Underwear, Ltd., the new corporation which took over the G. B. Perry Knitting Co. a few weeks ago. The exact increase has not been determined at this date. They manufacture ladies' and children's ribbed underwear, summer and winter weights, on equipment at present of 30 knitting machines and 40 sewing machines. The product is sold through Duncan Bell, Montreal. The Princess Underwear, Ltd., has capital stock of $100,000. Wm. Gee is president and John Armstrong is treasurer. A new building for the new machinery equipment is now under construction.

Connecticut, Poquonock. The space occupied by the old boilers in the Dunham Hosiery Co.'s plant will be converted into a drying room. The steam connections between the newly installed boilers and the mill proper have been completed and the old boilers will be removed as early as possible.

*Georgia, Raccoon Mills. John M. Berry, president of the Rome Hosiery Mills of Rome, Ga., is one of the largest stockholders in the Berryton Mills, the new corporation organized with capital stock of $150,000 to take over the Raccoon Co.'s property. The name Raccoon Mills will be changed to Berryton in honor of Mr. Berry. All the buildings will be repaired and put in first class shape and machinery will be installed to turn out about 1,200 dozen ladies' and misses' hosiery per day. It is reported that about $80,000 will be spent on new machinery.

*Illinois, Belleville. In about two weeks the Belleville Hosiery Mills will begin the construction of a new mill on land recently purchased. It is expected to have this building completed and equipped for manufacturing about November 1. The plant is to be increased from 24 knitting machines to 90 knitting machines, operated on fine gauge seamless, mercerized and silk half hose. The new mill will adjoin the old building in which they began manufacturing last November and which will be used for storage only upon the completion of the new mill. In building this new plant provision is to be made for the most up to date conditions of manufacturing, dyeing and finishing hosiery. The machinery will be operated by electric power. The Belleville Hosiery Mills have capital stock of $30,000. Emil Geil is president and Paul F. Vogel is treasurer, superintendent and buyer.

Massachusetts, Ipswich. E. W. Pitman, the contractor, has started work on an addition to the finishing plant of the Ipswich Mills, which will be of brick construction, 83 by 87 ft., 4 stories high.

*Michigan, Grand Rapids. The new mill of the Clark Knitting Co. has been equipped and the concern is now manufacturing in the new quarters.

Michigan, Muskegon. The Muskegon Knitting Mills, Louis P. Haight, proprietor, are adding 16 new knitting machines for making hosiery and 3 webbing machines for underwear. This will make a total of 61 hosiery machines and 15 underwear machines.

Mississippi, Meridian. An increase has been made in the capital stock of the Priscilla Mills from $30,000 to $130,000 and the plant is to be greatly enlarged. A few months ago plans to establish a yarn mill, to supply the yarns used, were considered and it is probable the increase in capital is to finance the establishment of a yarn department. A. W. McLellan is president, and W. H. McLellan of the Alden Mills, New Orleans, La., is agent and buyer. Seamless fine gauge hosiery is manufactured on 100 knitting machines and the product is dyed and finished at the plant.

New York, New York City. Max Meyer & Sons, manufacturers of sweater coats, have moved to larger quarters at 569-71 Broadway, corner of Prince St. and will make some increase in the capacity of the plant.

New York, Philmont. It is said that steps will be taken at once to increase the capacity of the Columbia Mesh Knitting Co. Frank B. Harder, president of the High Rock Knitting Co. of Philmont, has been elected president of the Columbia Co.

*South Carolina, Greenville. Several weeks ago the Nuckassee Mfg. Co. was incorporated and it was understood they would engage in the manufacture of knit goods. For the present at least no knit goods will be made. The company is devoting all its energies to the manufacture of athletic underwear, pajamas and similar goods, buying the cloth in the market.

Dyeing, Bleaching, Printing, Etc.

BLEACHING OF WOOLEN YARN.

BY DR. LOUIS J. MATOS.

A correspondent asks for information as to the proper method to adopt for the successful bleaching of woolen and worsted yarns by means of sodium bisulphite as the bleaching agent.

Bleaching of wool in any form or by any process cannot be successful unless its preliminary treatment has been given close attention, which means that the raw wool should have been thoroughly scoured, and in case of yarns, that all picker-house oils be completely removed. Uniformity in scouring, however, is more the exception than the rule and the degree of perfection reached in any one mill is variable, depending in a great measure upon the amount of wool to be bleached and other local conditions.

In the case of yarns, the scour boss should see to it that all oils and grease are completely removed and that the after-rinsing is thorough before passing on to the bleach process.

For many years sulphur has been the most widely used bleaching agent for wool and to this day the well known sulphur house, with all of its drawbacks, occupies a prominent position in the woolen industry, but there are a number of mills that do not care to erect a sulphur house, and consequently the so-called "chemical" bleaching processes employing soluble sulphur salts are regarded with much favor, for the reason that they require only ordinary dye-tubs or similar tanks to contain the solution, and which are always under the control of the workman who can watch the process and the progress of the bleach from time to time, a feature not possible with the sulphur-house method.

The principle of bleaching with soluble sulphur sacks is based upon the fact that sulphurous acid is the bleaching agent liberated in the solution and producing the same result on the yarn immersed therein, as if the moist yarn had been hung in the sulphur house filled with sulphurous acid gas.

The chemical used to charge the bath for bleaching is commercial sodium bisulphite—purchased either in solid or liquid form—together with a little oil of vitriol insufficient quantity to exactly break up the bisulphite. For practical work the bath of about 1,000 gallons capacity is charged with 20 to 25 gallons of solution of sodium bisulphite of 70 per cent Tw., and with 1-1/2 to 2 gallons of oil of vitriol. The bath is well mixed, and the yarn is immersed, turned several times, and allowed to remain in the liquor several hours, turning again at intervals until the bleach is satisfactory, then lift, drain and pass through a fresh cold bath of about 1,000 gallons' capacity, containing about 3 quarts of oil of vitriol. Wash well to remove all traces of acid and dry at not too high a temperature or too rapidly.

If freight charges are an item, the use of solid bisulphite must be considered, in which case about 100 pounds will be used where 20 gallons of the commercial solution above mentioned are employed, the amount of acid being the same.

It is a well known fact that wool cannot be bleached by any process absolutely white, but the clearness and purity of the shade of bleached wool can be greatly improved by adding either to the bleach bath or to the last rinsing bath a trace of one of the following dyestuffs:

Formyl Violet S4B or 10B,
Methyl Violet B or 6B,
New Methylene Blue GG or N,

according to the kind of white desired. As the condition of each batch of bleached wool governs itself, the exact amount of any of the above dyestuffs cannot be given, but a few simple trials will indicate just how little of any one is to be used to produce even the so-called "porcelain white."

Bleaching with solutions of sodium bisulphite is best done in wooden vats, although in Europe stone or cement vats are frequently used, as wood is not so plentiful. The

use of metal is not to be recommended for the reason that while the batches are apparently well bleached, large patches of discoloration sometimes appear afterwards, the presence of which have been traced to metallic salts.

While the resulting bleach with sulphurous acid is generally very good, meeting all commercial requirements, there is always a tendency of the wool to retain for a long time the odor of the bleach, unless it is chemically destroyed, consequently the sulphur bleach is not to be absolutely recommended, particularly in cases where high class yarns are to be bleached, for which latter the use of the peroxide of hydrogen or sodium should be carefully considered, as the wool is left as white as the color of pure wool naturally permits. The wool may be afterwards "dyed white," and the bleacher has the satisfaction of knowing that his bleach will stay white and not gradually "yellow," as is always the case when wool in any form is bleached with sulphur.

STEAM BRUSHING WOOL GOODS.

BY SERGIUS.

(In the Dyer and Calico Printer.)

(Continued from June.)

Steam is then turned on gently until the box is properly warmed and all condensed steam run away. The steam is then shut off, the trough uncovered and all carefully wiped down free from spots of moisture. This preliminary warming is always necessary when the machine has been standing; failing it, the cloth would be spotted with water from the steam, each place showing a dull, raw mark. Many cloths require different treatment in steaming between the face side and the back, while some only need the application of steam to the face, leaving the back glazed.

Cloths of the best qualities are steamed down much further than lower makes, as the quality of the wool allows this, while goods made from coarse wiry wool, as well as shoddy cloths, require a large amount of glaze to be left on to impart a spring and handle. Technically the glaze put on by pressing is known as "condition," and a cloth finished with plenty of this on is called in "smart condition." On the other hand when well steamed down, the finish is known as "soft finish," and the appearance of the cloth is less shiny and lustrous. To leave a fine all wool botany cloth with a large amount of this smart finish on it would be just as absurd as to steam a fabric made from inferior materials down to soft finish. In the first case the unnecessary glaze would give a papery thin feel to the fine cloth, disguising much of the quality, while in the second case to steam a low cloth soft would be to reduce it to the condition of a rag.

Good faced cloths will stand steaming well down both face and back, as they possess a permanent gloss by raising and boiling, but many cloths owe most of their appearance and much of their backbone to the high condition left on the material. Two very widely differing instances may be given here; these are the different finish required by a thin and low crossbred worsted and by a high class woolen trousering. The worsted must have only a breath of steam on the face, and that given very cautiously, while the other requires slowly steaming down both back and face until all the gloss has gone. With thin fabrics steaming has to be given slowly and gently, otherwise there is a danger of blowing through them and leaving the cloth as limp as a rag. For this reason it is safer to run them longer on a short allowance of steam, rather than save time by steaming quick.

The theory of successful steaming can be summed up as follows: After pressing well, the cloth is in a dense, compact state with a springy, leathery feel. In steaming off the outer gloss the steam should be given so gently that it does not penetrate the interior. When this is done effectually the fabric possesses handle and life due to the firm condition of the cloth's interior, while there is little trace of gloss on the surface.

Steaming mills may also be used for brushing or setting up cloths previous to cropping; for this purpose the steam is shut off entirely and only the brushes used. For shrinking cloths by the blowing in of hot

steam the ordinary steaming mill is useful, while it is sometimes used for closing up the unsightly gill marks caused by tentering machine gills. To use it for this purpose the lids of the steam trough are pushed into the center of the trough, leaving only the lists of the fabric exposed to the steam. The rate of traverse of a steaming mill requires to be fairly high to insure level action of the steam, which would have time to penetrate through the cloth if the rate of speed was slow. Means must be provided for the draining away of the water resulting from condensation.

THE DYEING OF UNION GOODS.

By SOLOMON RIVELIS, winner of the Textile World Record Gold Medal, Philadelphia Textile School.

(Continued from July.)

The influence of different salts (in dyeing Unions) on the shade of either cotton or wool is quite marked, but may be brought to naught if the amount of each be regulated. Formerly Glauber salt was mostly used in dyeing Unions, and later a mixture of Glauber salt and common salt was proposed for this purpose, but common salt alone will give the same results if only used in smaller quantities.

Fifty per cent. of Glauber salt, which is the usual amount used for dyeing unions, will give the same result as 25 per cent. of common salt, or as 37 per cent. of a mixture of Glauber salt and common salt. The ratio of these salts to each other may be expressed as follows: 2 : 3 : 4 common salt; Glauber common; Glauber salt.

f—The color of the wool. In dyeing light shades the color of the wool should be of first importance. As already mentioned, the wool before dyeing is always a little darker than the cotton under the best conditions, but if the difference is quite marked and the goods are to be dyed a bright or light shade it will be best either to bleach the goods before dyeing or the two-bath process used, as it is difficult to cover the grey color of the wool without altering the shade.

RECIPES FOR DYEING UNIONS.

It must be understood that no recipe will hold good unless it is applied to the same quality of goods and under the same conditions under which it was worked out. A greater dilution or concentration of the dye bath or a larger boiling may give unexpected results. It need not be mentioned that more or less wool in a given lot plays an important part, especially with mixtures that contain neutral dyeing acid dyes, hence no standard formula can be given for dyeing union goods. The following few are mere suggestions of different mixtures of dyestuffs, the proportions of which should be changed according to the occasion.

Recipe No. 1. Navy blue (dark).

2% Cotton Black.
2% Oxamine Blue R X S N.
1% Sulphocyanin G.
1/2% Acid Violet 4 B.
25% Common Salt.
1% Borax.

Start at 140° F., work slowly to the boil, boil till the wool is dyed to the shade, turn off the steam, work at 160° F. till the cotton is matched to the same shade.

Recipe No. 2. Perfect black.

4% Cotton Black.
1% Palatine Black 6 B.
1/2% Guinea Green B.
1/2% Guinea Violet 4 R.
25% Common Salt.

Dye in the usual manner for 1 1/2 hours, then rinse, and pass the goods through 1 per cent. solution of Formaldehyde for 15 minutes cold. Rinse again and dry.

Recipe No. 3. A good black

2% Oxidiamine Black B M.
3% Direct Deep Black E.
2% Zambesi Black D.
25% Common Salt.

Dye the same way as No. 1.

No. 4. Navy blue medium.

3% Oxamine Blue R X N S.
1/2% Sulphocyanin G.
1/5% Guinea Violet 4 R.
25% Common Salt.

Dye the same as No. 1.

No. 5. Gives the same color as No. 4, but duller.

2% Diamine Black B H.
2% Oxamine Blue R X N S.
1/2% Sulphocyanin G.
1/10% Guinea Violet 4 R.

No. 6. Dark green.

3% Diamine Green B.
25% Common Salt.

Method same as No. 1.

No. 7. Grass green.

1% Diamine Green B.
3/5% Chrysophenine.
3/5% Dianil Brown 3 G O.

No. 8. Brown.

2% Direct Deep Brown B.
2% Diamine Green B.

No. 9. Steel grey.

4/100% Wool Black 6 B.
4/100% Oxidamine Black B M.
1/100% Guinea Green B.
20% Common Salt.

No. 10. Slate.

2/10% Direct Deep Brown B.
3/10% Diamine Green B.
1/10% Diamine Red 4 B.

Add the red to the cooling bath so as not to dye the wool.

No. 11. Greenish grey.

4/100 Oxamine Blue B X N S.
4/100 Guinea Green B.
4/100 Sulphocyanin G.
2/100 Oxidiamine Black B M.

THE DYER OF YESTERDAY, TODAY AND TOMORROW.

Comparing the two dyers, the one of the past with that of the present, it will be possible to form some idea of the one which is to come.

The dyer of the past was in the first place a master of his profession. His primitive methods of dyeing were his own property; results good and bad were the product of his own abilities. He had nobody to depend upon and whatever difficulty arose he himself had to overcome it. But with the introduction of the artificial dyestuffs and scientific methods of dyeing with simpler processes, the curtain which so closely protected the dyer from the public's eye was raised, his secrets gone—the dyer lost his power, and on comes the new dyer, the dyer of the present. He simply carries out processes and methods given with each dyestuff or a certain class of dyestuffs; he knows very little about the nature and composition of the color he uses, they come ready for use, and all he retained from the old master is the color matching.

In the meantime the manufacturers of dyestuffs are putting up more colors, the letters of the alphabet are not enough for their subdivisions and numbers must be affixed. With each new dye follows its mode of application, its merits and so forth, hence the dyestuff people are constant teachers and advisers of the dyer, and the latter is gradually giving over all the responsibilities to them. Every difficulty the dyer comes across is being taken up by them. As a matter of fact the majority of the dyestuff manufacturers employ special men, whose duty it is to help and correct the dyer, and thus the dyer becomes more and more dependent.

Union dyeing is a subject that requires some thinking, skill and patience. This was taken up by the dyestuff people and as a consequence we have a number of special union dyes, half wool dyes, etc., which were gladly received by the dyer. Nobody claims that these union dyes are new colors, because they are not. They are smart mixtures of neutral dyeing acid dyes with direct cotton colors or sometimes just a mixture of cotton colors alone. But the dyer prefers to use these instead of going through the trouble of finding himself a proper combination of dyestuffs that will work good both on cotton and wool. It is very probable that he has the necessary colors in stock, but it is so much easier to use the others.

And if we will follow the same path we may brace our new dyer to the following type.

He, the dyer to come, should he get in a lot to dye up to a certain shade will sit down and write the following letter to the dyestuff people:

"I have on hand two thousand pounds of woolen goods to match up to the shade, the sample of which I enclose.

"Kindly send me the proper amount of color for same and oblige."

And the next day there comes a barrel of dyestuff with the following directions:

"Dump the contents into the bath, turn on the steam, boil for one hour."

No salt necessary!?

SPECIAL PROCESSES IN WOOLEN FINISHING.

(Continued from March.)

The webs and cloth were wound together on to a perforated steam cylinder under considerable tension, and when decatized or steam blown in this state gave a durable embossed design the reverse of that on the web. Figs. 4, 5 and 6 illustrate the structure and effect of the webs used, Fig. 5 being a view of the web's pattern, and Fig. 4, a section showing the parts in relief. Fig. 6 is a section of the embossed fabric with the pattern reversed.

Embossing is executed at the present time by means of engraved and heated rolls, but the demand for it is very small, as the popular taste runs in the direction of cheap tweeds.

Figs. 7 and 8 show a woolen finishing machine used for producing a friezing or napping effect; formerly this was much in favor, and it may be again revived as the weathercock of fashion veers. The use of this machine produced a curl on the face of the cloth, varying from the size of a pinhead to that of an inch or more in diameter. To obtain this finish, the fabric was raised until a full close nap was obtained, covering the cloth until the structure could not be seen, after which it was ready for the friezing process. The principles of this are illustrated in Fig. 7, which is a sectional plan of the machine. B is a solid fixed bed or table, slightly wider than the cloth at full width. This is level and true, and is covered with stiff plush to hold the fabric in position. The plush is glued on in two pieces, the division being in the centre, and each half has its draw or slant of pile towards the edge. By this means it is impossible for the passing cloth to crumple or crease, since the lay of the plush tends to stretch it out at both sides. Over this table the fabric is drawn very slowly and under high tension, while a moving table, A, resting on the face of the cloth produces the friezing effect. This upper table is a counterpart of the lower one in size, but is covered on its under surface with glass paper, and has a rotary motion imparted to it by means of a cam and spindle at both sides. The result of this circular motion causes the glass paper to rub the pile into small curls with the fibers converging towards the center. Larger or smaller curls are obtained by regulating the area of the rotary movement, very fine ones being made by restricting the motion, while larger ones are obtained by increasing it.

In the older forms of machine the pressure of the upper table was regulated by inserting wood spindles or props between the table top and an overhead bar. These rested in holes in both bar and table, and could not work loose, as the rotary motion was confined to the table end. In Fig. 7 the fabric is seen passing between the brake rollers, E, and over the guiding roller, G. From here it passes between the two tables and down again to the scray. As the friction and drag on the cloth is considerable, the ordinary form of drawing rollers would be quite inadequate to draw the fabric through, so these are replaced by a card-covered roller, C, which imparts the necessary motion. Having its surface covered with sharp card clothing, this roller bites the surface of the cloth very keenly, so much so that it is necessary to employ a special stripping dvice for taking the fabric from it. This consists of a roller of lesser diameter fixed in bearings immediately below the card

roller, C; as will be noticed in the figure, the two rollers are connected with narrow belts of tape at every six inches of roller surface, which prevents the cloth from being carried round the card roller.

As will be expected, it is of great importance that both fixed and moving tables should be perfectly adjusted and level. Failing this the pressure and friction will be unequal, and will give imperfect or less developed curls where it is least. Fig. 8 is a front view of this machine; H is the entertent gone out. This is due to many causes; principally to the fact that the cloth must be made of good and fine wool to give a satisfactory pile. Many cloths made now require treating very gingerly, as the quality is so low the finisher cannot afford to lose any wool in either raising or cutting. Embossing was brought in to suit a lower make of fabric which could not spare any of its covering. Previous to this, the pile was cut into various designs by special machines, the construction and working of which will be

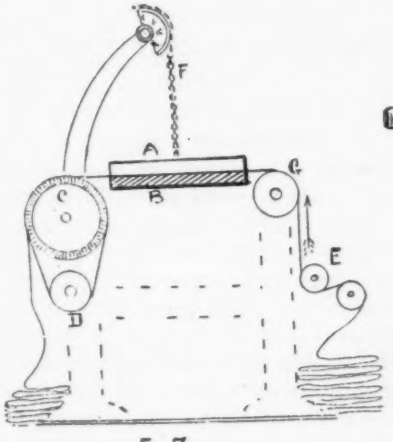


Fig. 7

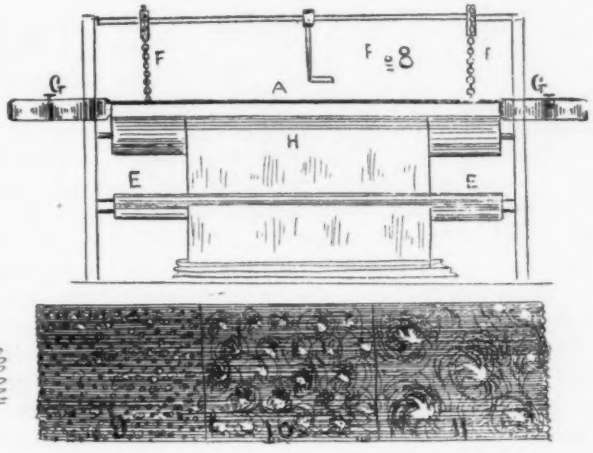


Fig. 8

ing fabric; and EE the brake roller; FF are two chains used for raising the moving table, and the handle for this purpose is seen midway between them. At GG are situated the cams and guides for imparting the circular rubbing motion to the table, A; these can be regulated to give any range of sweep from the smallest to the largest.

Figs. 9, 10 and 11 show the general shape of the curls together with the lay of the wool. These may vary from the tiny ones on a fine piled cloth to the large and bold curls given to an Irish frieze.

Formerly the upper table of a friezing machine was coated with a mixture of sharp sand and glue, the mixture being put on wet and scraped level with a straight edge. Now if glass cloth or paper is not used, its place is taken by rubber or by various compositions. Pile finishes have to a very great exdealt with in another article. Printed woolens are made to a considerable extent yet, some for the wholesale clothiers and others for the lining of thick overcoats. Previous to printing, the face is cut slightly, so as to get a better print. The fabric is a plain melton with a cotton warp buried in a thick shoddy weft.

The number of mills spinning woolen and worsted yarns in Sweden has decreased from 150 in 1896 to 128, but their producing capacity has increased from 8,052,000 pounds in 1906 to 15,092,000 in 1907.

The total value of ribbons exported from Switzerland in 1909 was $8,149,218, as compared with $6,978,358 during 1908. The exports to the United States in 1909 were valued at $478,626.

SPECIAL WOOLEN FINISHING.

(From Dyer and Calico Printer.)

(Continued from January.)

Seals and plushes both require a certain amount of raising in the wet state; this is actually more of a combing action than raising, since it is only necessary to disentangle the pile. For this purpose nothing is better than old sets of teazles which have lost their sharp bite and act only as brushes. After raising, many plushes require beating on the back with sticks. This causes the pile to stand erect and the material should then be tentered with as little handling as possible. Following tentering comes a careful brushing, sometimes with steam, at other times without, and a passage through a cutting machine just to take off the ends of the fiber and reduce the surface to uniformity. Pressing is out of the question, since this would flatten down the pile and ruin the appearance; even cutting is liable to crush and ruffle the nap, and therefore the material is hung up on hooks.

Many of the printed plushes used for lining carriage rugs require nothing more in the matter of finish beyond a single cut just to level the surface; others, more after the seal variety, take much time and care in beating, steaming, and brushing.

COTTON COATINGS.

These are imitation worsteds made entirely of cotton, but beyond the structure there is no likeness. They require little finishing after tentering, and neither cutting nor pressing, while their appearance is dull and lifeless and their handle limp. It is almost impossible to finish these goods without crimps forming, as unlike worsteds they will crimp by being folded when cold and dry. So sensitive are they to rubbing that drawing a finger nail across them will form a white streak. Owing in a great measure to this fault their manufacture has been discontinued.

SHAWL CLOTHS.

These are woven in lengths with spaces between each shawl of bare warp; this when cut forms the fringe on each end. Beyond cutting on a hollow bed these cloths call for no special remark. The hollow bed protects the fringe from damage, but does not get so close as a spring bed.

MIXTURES.

These are worsted fabrics or worsted with cotton in the cheaper styles; they do not require any crabbing and the scouring necessary is only light. Some qualities, especially those for linings, can be scoured sufficiently with a little fuller's earth and ammonia.

MODERN DYEING CONDITIONS.

B. J. HOBROYD.

(From the Dyer and Calico Printer.)

(Continued from July.)

After-chromed colors have come to the front lately, and a good many blues have been introduced which possess rich bloomy shades, together with great fastness to light. It has long been known that after-treatment with metallic salts gave greater fastness to the shade, and with the natural dyes it was common to fasten them with a bath of copper sulphate. Besides increased fastness to light, the cloth was cleaner to rubbing, and the shade was not saddened to any extent, while the resistance to potting and decatising was much improved.

With these advantages it would appear strange that after-chromed shades have not replaced ordinary dyeings; the reason is the difficulty of accurately matching to shade. Modern conditions demand the identical shade, not on a dozen pieces but on hundreds, and if all were constructed exactly alike the task would be comparatively easy. Lengths, weights, and fineness of fiber prevent dyeing from being carried on like an exact science. As a case in point, one fabric may be much lighter bulk for bulk than another and yet take much more dye to obtain the same shade. This is the case with very fine wools which have naturally a larger surface area.

The requirements of the wholesale clothing trade are the principal cause for uniformity of shade being insisted upon. Be-

fore cloth was cut out for garments by machinery every suit came from the same piece. Now a coat may consist of pieces from three or four dyeings, a sleeve from one, back from another, etc. No matter how carefully dyed, when matched to the shade slight variations must creep in. One lot may be the veriest fraction of a shade under the pattern and the next lot just a fraction over it. Both appear good matches, and it is only when the two are seen together that the difference is seen to be pronounced.

Alizarine dyes on pieces are not in such favor for piece goods as they were formerly. The colors are fast enough, particularly to light, but the shades are by no means bright. In the dyeing the bath must be on the actual boil to obtain good results, and long boiling together with the acetic acid used tends to impart a hard feeling to the cloth. Still the colors are very useful for cloths which have to undergo potting and the influence of steam, and they are well adapted for such material as the faced cloth of uniforms.

Dyeing low meltons is by no means profitable for the dyer even taken at its best, but still ends may be made to meet if the claims for damages and bribes are not too excessive. Unfortunately in this trade, the dyer is the mark for nearly everyone who wants to shoot at him, and the claims he sometimes has to face are outrageous. As a sample of the treatment some dyers get in this trade, the following will suffice: A melton dyer known to the writer was mulcted so many times with claims for damages said to have been caused in the dyeing, that he went to the owners of the goods and asked to see the bribes cut from his dyeings. In reply, a huge heap of remnants was pointed out to him with the remark that he had better sort his own out of that. Such treatment can only be dealt with by refusing the work, unless the claims are agreed upon not to exceed 2 1/2 to 3 per cent. on the account. Of course small damages only are covered by the deduction, such a thing as a damaged piece coming in another category.

The lowest grade of melton cloths is made in lumps. These are 120 yards long, 112 inches wide, and after dyeing are cut in two and split down the center, thus making four pieces of a width of 56 inches, and a length of 60 yards. What heavy, awkward lumps these are to handle may be well imagined, and the trouble is doubly enhanced when the goods are full of water. Fast colors are not asked for in this trade; in fact, the cost of dyeing them is quite out of the question, and if the dye will stand cold water that is quite sufficient. Many of this class require burl dyeing after the woolen is filled up. This is frequently done by adding the dye in the washing machine, and working cold. All that is needful is to stain the cotton specks which show a pepper and salt appearance; a small quantity of the cheap basic dyes are sufficient to effect this. Cloths of the description mentioned may be bought wholesale for 8 d. to 10 d. per yard dyed and finished, and heavy weights 20 to 24 ounces per yard at that, so it is very obvious that nothing very expensive can be done in either dyeing or finishing.

The chloring of woolens has been experimented with rather largely in connection with the prevention of shrinkage in flannels. It certainly effects this, but at the cost of depriving the wool of its most important feature, its elasticity. The changes which take place in the wool fiber during treatment with chlorine are very complicated and deep-seated, and little is known of the causes. Chlorination was first introduced by Lightfoot in 1865. The idea then aimed at was to impart a silky luster to the fiber apart from all considerations of shrinkage.

Physically, the changes in chlored wool are very marked; the fibers turn yellower and are much more permeable to dyes, while the handle is rougher and the luster increased. There is little doubt that the fibers are to some extent disintegrated and decomposed, and tendering of the fabric is naturally inevitable; this, however, is accompanied by a loss of felting power which may be desirable, but certainly robs the cloth and leaves it lifeless.

Gaseous chlorine appears to exercise little effect on the wool, the most energetic action taking place between wool and solutions of the hypochlorites when the latter are set

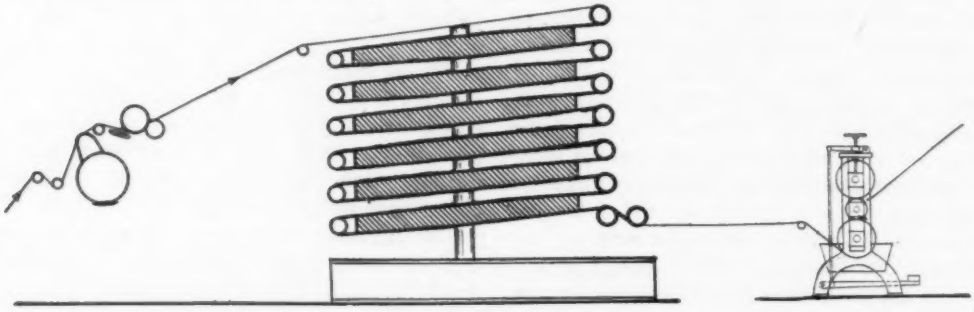
free by a mineral acid. All the hypochlorites act alike upon wool fibers. Sodium hypochlorite, bleaching powder, and eau de Javel give precisely the same results when their ocyacids are released. After chloring, wool has the property of turning a solution of potassium iodide and starch blue, although all traces of the chlorine have been removed by repeated rinsing, while a boiling solution of bleaching powder completely dissolves chlored wool. Solutions of tin salts, both stannous and stannic, are often used upon chlored fabrics. These will certainly render the handle harsher than before, as this property of tin is well known in the dyeing trade.

FINISHING BED SPREADS.

Boston, Mass., July 14, 1910.

Editor Textile World Record:

The interesting article by "Delco" under this heading in July edition leads me to suggest a few changes in the handling of these goods. First, the goods coming out of the bleach into a water mangle is always detrimental to a raised figure, no matter how light the set may be and should be avoided. Some concerns extract in the centrifugal. This entails labor cost and more or less danger of soiling the goods by this handling. A better method is the use of the new suc-



MACHINE FOR FINISHING BED SPREADS.

Producing drabs and fawns on box cloths and faced goods is, without doubt, the highest branch of the woolen dyer's craft. The cloths are expensive, very thick and dense, and uniformity of color is imperative. To obtain this requires the utmost care, patience and forethought, while, together with these qualities, must be the most scrupulous cleanliness. Dye houses turning out this kind of work cannot at the same time dye dark shades without the risk of staining the lighter shades, which it is almost impossible to prevent.

The imports of cotton goods into the United States during 1909 was $62,010,286, compared with $73,704,636 in 1907 and $41,296,239 in 1900.

The exports of woolen dress goods for the three months ending March 31, 1910, from Plauen to the United States amounted to $93,663 as compared with $147,955 for the same period in 1909.

the open over the suction slot, 60 per cent. of the moisture can thus be withdrawn.

In the starching of the goods in the wet, great care must be taken never to carry too much water or the starch sizing will be weakened and will result in uneven work. Twenty per cent. of moisture left in the fabric will do no harm; on the contrary, on such heavy goods it will have a tendency to make the fabric assimilate the starch better, so for the evaporation of this surplus moisture, 20 per cent., I would recommend the use of the new type of horizontal cell drier as shown in the accompanying drawing, connected with the "Goffard" suction extractor. The cell drier, as will be seen, is arranged for a one side drying throughout.

A continuous process could be followed out by passing the goods as they come from the cell drier directly into the starch sizing trough and mangle, thence to another cell drier, which could be fitted up with some flat or non-contact cells to partially dry by radiation; this will prevent any of the starch

sticking to the heated metal; the other cells to complete the drying would be the regular slightly curved or contact cells. Expanders or stretchers could be placed anywhere on the cell drier in place of one or more of the carrier rolls. If the bed spreads are likely to be pulled in the bleaching, a tenter frame could be used to advantage, taking the spreads as they come from the starch mangle, straightening and bringing out to width and from there the goods would be carried on to another cell drier for the final drying. Such a range would show great economy in floor space and a very important saving in seconds, for all will agree, that the manufacturing profits are increased by keeping the goods moving without a break.

I make no criticism of the reels used with the cylinders, they are just right for a very small production and ample floor space, something which is not generally found in our American mills.

John D. Street.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 113.

Blue on Worsted Yarn.

Victoria Navy Blue L H on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Victoria Navy Blue L H.

(Farbenfabriken of Elberfeld Co., 66 Lafayette St., N. Y.)

10 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 120° F., bring slowly to a boil, and boil for one hour.

Victoria Navy Blue L H dyes easily level, and will be found of value for the dyeing of ladies' dress material. It will be found sufficiently fast for ordinary requirements.

Recipe No. 114.

Blue on Cotton Yarn.

Chlorazol Brilliant Blue 14 B on 100 lbs. bleached cotton yarn. Prepare the dye bath with

½ lb. Chlorazol Brilliant Blue 14 B.

(Read Holliday & Sons, 11 Gold St., N. Y.)

5 lbs. Common Salt.

Dye in the regular way.

Chlorazol Brilliant Blue 14 B possesses good fastness to light, washing and alkali. It is noted for its brilliancy of color.

Recipe No. 115.

Black on Silk Noils.

Fast Silk Black G on 100 lbs. silk noils. Prepare the dye bath with

10 lbs. Fast Silk Black G.

(Kalle & Co., 530 Canal St., N. Y.)

15 lbs. Acetic Acid.

Enter at 120° F., bring slowly to a boil, and dye at a boil for 45 minutes. Then add

2 lbs. Sulphuric Acid.

Boil 30 minutes and then add

2 lbs. Potassium Bichromate,

and continue the boiling 45 minutes longer.

Fast Silk Black G will satisfactorily withstand action of light and fulling. If rinsed in a bath containing

2 lbs. Puropol,

after the chroming, the feel of the material will be greatly improved.

Recipe No. 116.

Yellow on Worsted Yarn.

Brilliant Acid Yellow No. 6,659 on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Brilliant Acid Yellow No. 6,659.

(Innis, Speiden & Co., 46 Cliff St., N. Y.)

10 lbs Glauber's Salt.
3 lbs Sulphuric Acid.

Enter yarn at 120° F., bring to a boil, and dye at a boil for one hour.

Brilliant Acid Yellow No. 6,659 is of exceptional fastness to light, fulling and steeping, also a very level dyeing color, and will be found useful in combinations or alone in the dyeing of wool or worsted piece goods, woolen yarns and carpet yarns, for the production of a variety of fashionable shades where exceptional fastness to light is required.

Recipe No. 117.

Scarlet on Cotton Yarn.

Helindone Fast Scarlet R paste on 100 lbs. cotton yarn. Prepare the dye bath with

30 lbs. Helindone Fast Scarlet R paste.

(H. A. Metz & Co., 122 Hudson St., N. Y.)

10 lbs. Caustic Soda, 40° Be.
5 lbs. Hydrosulphite M L B conc powder.
4 lbs. Helindoil.

The hydrosulphite is gradually stirred in and the mixture heated to 130° F. Stir well and allow to stand 30 minutes, when the reduction should be completed.

The yarn is dyed at a temperature of 130° F. for 30 minutes, and the shade then developed and brightened by soaping for 30 minutes in a boiling bath containing 2 parts of soap in 1,000 of water.

Helindone Fast Scarlet R paste possesses the excellent fastness characteristic of the Helindone colors in general.

Recipe No. 118.

Brown on Worsted Yarn.

Anthranol Brown D on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Anthranol Brown D.

(F. E. Atteaux & Co., 176 Purchase St., Boston, Mass.)

Enter yarn at 140° F., bring to a boil, and dye at a boiling temperature for one hour.

Then add

4 lbs. Magnesium Sulphate (Epsom Salts),

and continue the boiling 30 minutes longer.

Anthranol Brown D is very fast to light, fulling, cross-dyeing and steaming. In the dyeing of light shades the anthranol colors require no addition whatever, for medium shades only an addition of magnesium sulphate, and for heavy shades only acetic acid or bisulphate of soda.

Recipe No. 119.

Blue on Cotton Yarn.

Brilliant Congo Blue B on 100 lbs. cotton yarn. Prepare the dye bath with.

3 lbs. Brilliant Congo Blue B.

(Berlin Aniline Works, 213 Water St., N. Y.)

40 lbs. Glauber's Salt.
2 lbs. Soda Ash.

Dye for one hour at a temperature just below the boil. Brilliant Congo Blue B possesses fastness to light and weather somewhat better than the ordinary substantive blues, and in other respects its fastness is equal to or better than other direct cotton colors.

Recipe No. 120.

Black on Worsted Yarn.

Guinea Black 3 B L Extra on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Guinea Black 3 B L Extra.

(Berlin Aniline Works, 213 Water St., N. Y.)

15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter yarn at 140° F. and dye at a boil for one hour.

Guinea Black 3 B L Extra possesses good penetrating power, and good fastness to light, acids, carbonizing and perspiration.

Recipe No. 121.

Blue on Worsted Yarn.

Fast Chrome Blue B X on 100 lbs. worsted yarn. Prepare the dye bath with

4 lbs. Fast Chrome Blue B X.

(C. Bischoff & Co., 451 Washington St., N. Y.)

5 lbs. Acetic Acid.

Enter at 120° F., dye at a boil for 3/4 of an hour, then add

1½ % Sulphuric Acid,

and continue the boiling one-half hour. Then add

3 lbs. Potassium Bichromate

and boil one hour longer.

Fast Chrome Blue B X is very fast to sunlight even in weak shades.

Recipe No. 122.

Yellow on Worsted Yarn.

Radial Yellow on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Radial Yellow C.

(Badische Co., 128 Duane St., N. Y.)

15 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 160° F. and dye at a boil for one hour.

Radial Yellow C is recommended for piece dyeing, printing and paper coloring on account of its purity of shade, brilliancy and excellent fastness of light.

Recipe No. 123.

Grey on Worsted Yarn.

Fast Chrome Grey B Conc. on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Fast Chrome Grey B.

(C. Bischoff & Co., 451 Washington St., N. Y.)

5 lbs. Acetic Acid.

Enter at 120° F. and dye at a boil for one hour. Then add

2 lbs. Potassium Bichromate

and continue the boiling one hour longer.

Fast Chrome Grey B Conc. possesses excellent fastness to sunlight even in very weak dyeings.

Recipe No. 124.

Scarlet on Cotton Yarn.

Diamine Fast Scarlet 5 B F F on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Fast Scarlet 5 B F F.

(Cassella Color Co., 182 Front St., N. Y.)

20 lbs. Glauber's Salt.
1 lb. Soda Ash.

Enter at 180° F. and dye at a boil for one hour.

Diamine Fast Scarlet 5 B F F is distinguished by its brightness and property of exhausting well from the dye bath.

Recipe No. 125.

Orange on Worsted Yarn.

Anthranol Orange on 100 lbs. worsted yarn. Prepare the dye bath with

1½ lbs. Anthranol Orange.

(F. E. Atteaux & Co., 176 Purchase St., Boston, Mass.)

Enter yarn at 140° F., bring to a boil and dye at a boiling temperature for one hour.

Then add

4 lbs. Magnesium Sulphate (Epsom Salts),

and continue the boiling 30 minutes longer.

Anthranol Orange is very fast to light, fulling, cross dyeing and steaming. In the dyeing of light shades the Anthranol colors require no addition whatever, for medium shades only an addition of magnesium sulphate, and for heavy shades only acetic acid or bisulphite of soda.

Recipe No. 126.

Black on Worsted Yarn.

Acid Alizarine Black B on 100 lbs. worsted yarn. Prepare the dye bath with

6 lbs. Acid Alizarine Black B.

(American Dyewood Co., 84 William St., N. Y.)

20 lbs. Glauber's Salt.

5 lbs. Acetic Acid.

Enter at 160° F., raise to a boil and dye at a boiling temperature for 1/2 hour, then add

1 lb. Sulphuric Acid

and boil a further half hour.

Acid Alizarine Black B is exceptionally fast to milling and carbonizing and requires no after treatment.

Recipe No. 127.

Blue on Cotton Yarn.

Chlorazol Brilliant Blue 14 B on 100 lbs. unbleached cotton yarn. Prepare the dye bath with

½ lb. Chlorazol Brilliant Blue 14 B.

(Read Holliday & Sons, 11 Gold St., N. Y.)

5 lbs. Common Salt.

Dye in the usual way.

Chlorazol Brilliant Blue 14 B possesses good fastness to light, washing and alkali. It is noted for its brilliancy of color.

Recipe No. 128.

Blue on Cotton Yarn.

Diazo Navy Blue R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diazo Navy Blue R.

(Gusenheimer & Co., 189 Front St., N. Y.)

5 lbs. Soda Ash.

Enter at 180° F. and dye at a boil for one hour. Then rinse and work for 20 imnutes in a cold bath made up with

2.5 lbs. Sodium Nitrite,
7.5 lbs. Hydrochloric Acid, 32° Tw.,

and finally develop by working 20 minutes in a cold bath made up with

1 lb. Meta Naphthol

dissolved in a small amount of caustic soda solution, and added to the necessary amount of water.

Diazo Navy Blue R, when diazotized and developed, possesses very good fastness to washing and does not bleed.

The average production of cotton for the world during the past six years is 17,863,000 bales, or 1,305,000 bales more than the production in 1909.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Oil Engine. The De La Vergne Machine Co., foot of East 138th St., New Work. An improved type of oil engine which is described in this issue.

Hosiery Board Clamp. Albert C. Beck, 605 W. Somerset St., Philadelphia. A patented clamp to enable the finishers in hosiery mills to increase the production and save boards and prevent injury to himself by jabbing the boards into his body. The clamp is attached to the finishing tables, is easy to adjust and inexpensive and is recommended to manufacturers by those who are already using them and finding them satisfactory.

Cloth Cleaning Machine. A. W. Buhlmann, 487 Broadway, New York, is introducing into this country a machine for removing the slugs and bunches from cloth in the finishing process, doing the work of the ordinary burling process. A description appears in this issue.

Improved Warp Moistener. The British Humidifier Co., Blackburn, England. A spray humidifier for moistening the warp during the process of weaving. The spraying apparatus is fixed above the warp between the back rest and the heddles.

Dobby Motion. Harling & Todd, Rosegrove Iron Works, Burnley, England. An improved dobby motion which, because of its solid construction and simplicity, has been named the "Durable" dobby.

Shuttle Box Spring. Edward Smith, 178 Garnett St., Bradford, England. An improved shuttle box spring by which it is claimed breakages are prevented, such as often occur during the hurried tightening of the bolt at the end of the box.

Wool Drying Machine. The Patent Conveyor Co., Huddersfield, England. An improved automatic wool drying machine. The wool is moved forward by metal bars which vibrate lengthways and also have a perpendicular motion by which alternate bars are raised and lowered, forming an air space under the material being dried.

Stop Motion for Drawing Frames. N. Schlumberger & Co., Gebweiler, Germany. An improved attachment for drawing frames, by which the frame is stopped automatically when the sliver breaks.

Yarn Moistening Apparatus. Benno Schilde, Hersfeld, Germany. A machine which forces hot and damp air through the yarn packed on bobbins in a suitable receptacle. Cold air is then forced through the yarn to cause the moisture to be deposited on the fiber and to prevent evaporation because of the heat, which has heretofore been a defect in the operation of this class of moistening machines.

Finisher Condenser. Werdauer Textilwerken, Langenhessen, near Werdau, Germany. An improved finisher condenser adapted for coarse yarn made from low waste such as tow, etc. It operates on the Bolette principle.

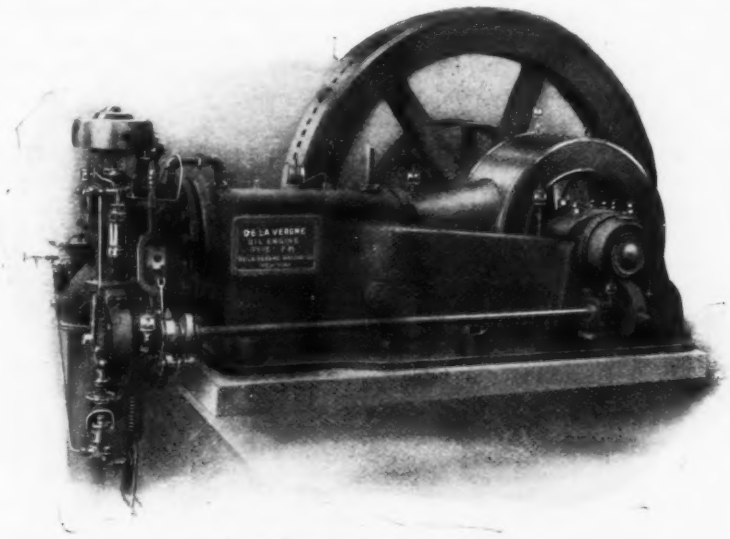
Heilmann Comber. Eugene Alisy, Chemnitz, Germany. An improved Heilmann comber in which the cylinder is provided with double working sections, making the process practically continuous instead of intermittent.

Spooler. Nagler und Sohn, Augsburg, Ger. An attachment for spoolers and similar machines by which the yarn is cleaned and an even tension maintained.

THE DE LA VERGNE OIL ENGINE.

This prime mover is the most recent product of the De La Vergne Machine Company of New York, for many years past the manufacturer of the well known "Hornsby-Akroyd" Oil Engine, of which many thousands have been sold and are in successful operation in the United States.

The new engine, like its forerunner, operates on crude petroleum, petroleum distillate or fuel oil; but to such an extent has the mechanism of this machine been perfected, that practically complete combustion is had with the heaviest class of refuse oils; and this is coupled with a mechanical and thermal efficiency fully equal to anything heretofore obtained with internal combustion motors.



THE DE LA VERGNE OIL ENGINE.

The "F H" engine is the result of many years of experiment on the part of its builders, and has been specially designed with a view to long life and the elimination of the minor troubles usually incident to internal combustion motors. Like the other De La Vergne Oil engines it is provided with a hot bulb or vaporizer into which the oil is sprayed. This bulb must be externally heated for a few minutes before the engine can be started, after which the heat is maintained by the combustion of the fuel which drives the engine. This heat ignites the charge at each stroke, no electrical or other form of igniter being required.

The engine operates on the four-stroke cycle and uses a somewhat high compression of about 200 pounds per square inch. The air drawn into the cylinder on the idle stroke, when compressed in contact with the hot cylinder walls, reaches a temperature of about 800° F. The oil is sprayed through this hot compressed charge into the vaporizing bulb by compressed air at a tension of about 500 pounds per square inch, furnished by an air-compressor forming part of the engine.

The highest cylinder compression after ignition in no case exceeds 550 pounds per square inch, and a valuable feature of the engine is found in the fact of the high thermal efficiency obtained without excessive cylinder pressures.

One of the advantages claimed for this engine is that the efficiency does not fall off materially until the load drops below 30 per cent. of the engine rating. Engineers will appreciate the economy of this feature. The

engine runs satisfactorily on the cheapest and heaviest grades of oil.

The builders inform us that no carbon deposits of any kind are to be found in this engine. Among its advantages is the fact that the fuel is easily obtained, is safely stored, requires practically no handling, and gives rise to no by-products. As a result there is no apparatus outside of the engine itself requiring attention.

One of these engines has been installed in the Snead & Company Iron Works, Jersey City, N. J., and in regard to the same the following report has been received of the cost of power for the three months ending March 31, 1910. The plant consists of one 17 by 27 1/2-inch De La Vergne type "F H" twin oil engine, rated capacity 170 b. h. p., direct-connected to one 1115 k. w., 500 volt d. c. generator; the electric current generated is utilized to drive the various electric motors in the factory and in lighting the plant when necessary:

Plant operated 79 days of 10 hours each.
KWH. developed at switchboard ..... — 41670
Brake HP. (by calculation) ..... — 62042

Possible Brake HP. at full load for 790 hours ..... — 134300
" KWH. as above (by calculation) ..... = 90169
" Load factor (790 hours) 46.213%

ACTUAL COST OF POWER

	TOTAL	PER KWH.	PER BHP.H
Fuel oil—32649 lbs. = 4442 Gals. @ 2¼c.	99.96	.00240	.00160
Lubrication—205 Gals. Misc. Oils @ 23 4c. per Gal.	47 96	.00115	.00077
Waste and Misc. Supplies	14.88	.00035	.00024
Labor—1 man $1.50 per day and extras	151.37	.00363	.00244
Repair fund (estimated)	76.70	.00184	.00124
Total—41670 KWH.	$390.87	.00937	.00629

Fuel oil employed 28.8° Gravity = 7.35 lbs. per Gal.
Lbs. Fuel Oil per BHP. H ..... = 0.526
Lbs. Fuel Oil per KWH. ..... = 0.783

These figures are not the results of a run under test conditions, but represent economies obtained in the regular course of operation of the plant during the period named; and that the engine in question was laboring under a great disadvantage on account of its light load, which was less than 50 per cent. of its rated capacity. If the engine had been operated at its rated load the only additional expense incurred would have been that of a larger quantity of fuel oil and the cost per k. w. h. would have been $0.00562.

It will further be interesting to note that the figures shown were obtained from a new engine during the first three months of its operation, and that while the item of lubrication is larger than what it should be, and the repair fund as charged greatly in excess of the correct average as determined by long experience with engines of this class, the sum total of power expense is very much lower than it is possible to expect from other and more complicated apparatus operating under the most favorable conditions.

ADVANTAGES OF VERTICAL SAW TOOTH ROOFS.

Vertical face saw-tooth roofs in mill construction, according to a recent paper by F. W. Dean of Boston, have certain important advantages over the more usual type with inclined face. "The vertical face," says Mr. Dean, "is somewhat easier to construct and permits ordinary windows to be used while the sloping face must have glass reaching to the bottom, or water will stand upon the horizontal mullions and finally leak. Furthermore condensation upon the inner surface of the glass is likely to drop unless the glass is in long panes from top to bottom. In either vertical or sloping faces the flashing should run under the

window stool and form a drip pan inside, from which the water can be drained off. The vertical face roof has the advantage that the windows can be made to swing for ventilation, while with the sloping roof galvanized ventilators must be placed upon the roof, or a vertical face must be made above the slope to carry swinging sashes. This is done from time to time. Neither this construction nor galvanized ventilators look well. Which form of roof is to be used in any case depends more upon the prejudices of the persons concerned than upon the effectiveness of either, as there is little to be gained in lighting effect by sloping the face."

THE BURT DOUBLE DAMPER VENTILATOR.

One of the important and difficult problems in the construction of weave rooms is that of ventilation. Many of the ventilators heretofore used have been defective, causing much annoyance and failing to insure proper ventilation of the rooms. It is to overcome these well known difficulties that the Burt Manufacturing Co., 432 Main St., Akron, O., have designed the double damper ventilator. Fig. 1 shows this ventilator open; Fig. 2 shows it closed. This damper is especially adapted for weave sheds, and was adopted by the Burt Mfg. Co. after it had been thoroughly tested for two years in some of the leading textile mills of the country and been pronounced a success. We are informed that it is being adopted by two-thirds of the new textile mills now being built. Owing to the condensation on the air shaft of the ordinary ventilator and the water dripping into the work rooms, many textile manufacturers have recently replaced them with the Burt type.

By the use of the double-damper ventilator the temperature of a room can be easily regulated, owing to the fact that both dampers work together, and in very cold weather, when it is necessary to retain all the heat in the building, both dampers can

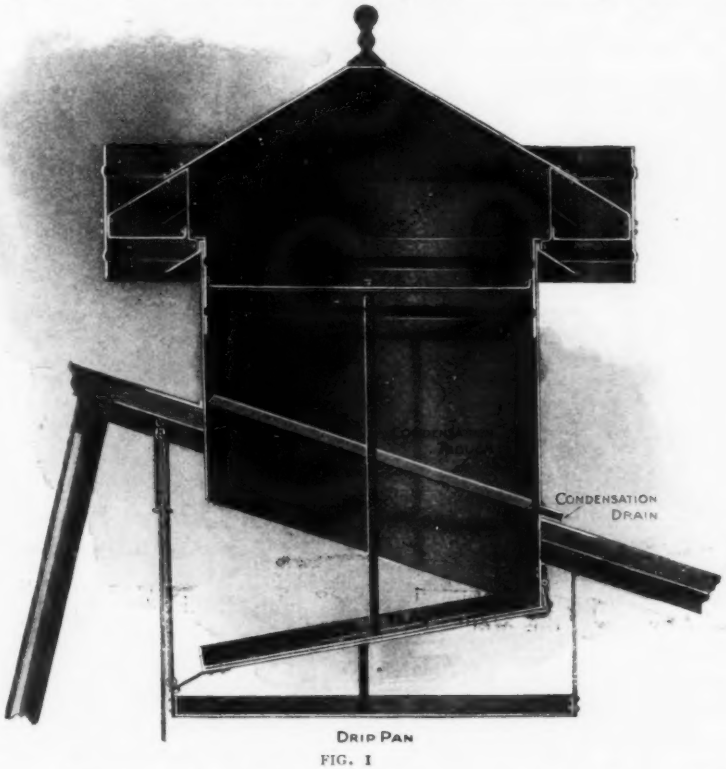


FIG. 1

be closed, thus retaining all the warm air, and at the same time no condensation collects on the air shaft. This does away with the annoyance of dripping water on machinery and cloth, which was a common occurrence where the usual ventilator or cowl was used.

When the ventilator is open and the condensation is very severe, the lower damper

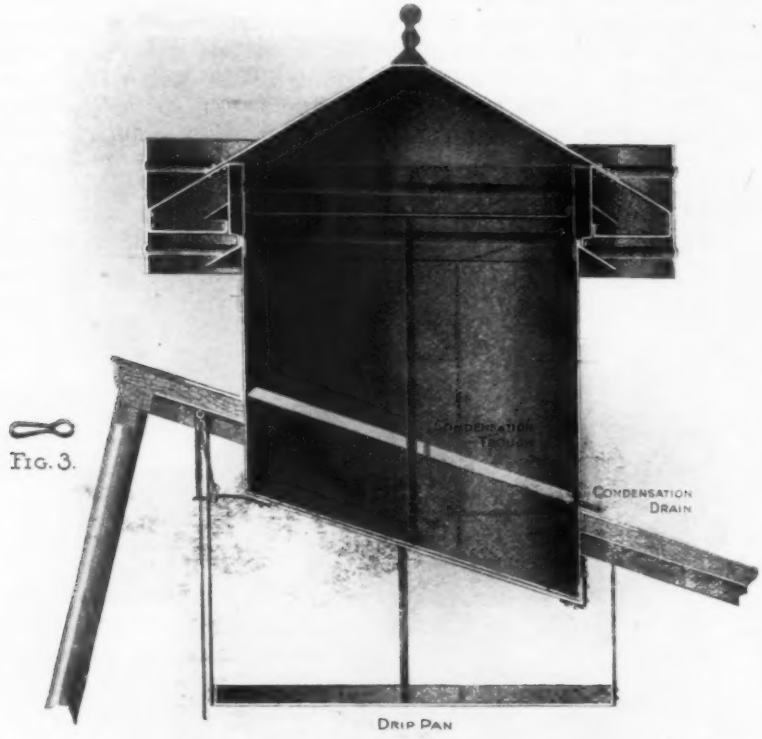


FIG. 3.

FIG. 2

acts as a drip pan and collects the moisture, and this evaporates, owing to the high temperature of the room. The lower drip pan is placed below the bottom damper more as a safety device, so that, in case the lower damper should overflow, this would collect all the surplus water; if desired, pipe connections can be made so as to pass the water to a sewer from the roof.

The condensation trough in the air shaft collects a great deal of the moisture and passes it to the outside of the ventilator. Where the dampers are closed the rope is forced into a special attachment, fastened to the roof, and held firmly, and it is then not necessary to tie it to a nail, hook or post, as in the case where the common flat dampers are used.

Among the mills that have recently installed Burt double-damper ventilators are the following: Greylock Mill, North Adams, Mass.; Dartmouth Mfg. Corporation, New Bedford, Mass.; Danielson Cotton Mill, Danielson, Conn.; Narragansett Mills, Fall River, Mass.; Ponemah Mills, Taftville, Conn.; Manville Mfg. Co., Manville, R. I.; Loraine Mills, Saylesville, R. I.; Warwick Mills, Centerville, R. I.; Potomska Mills, New Bedford, Mass.; Grinnell Mfg. Co., New Bedford, Mass.; French River Textile Co., Mechanicsville, Conn.; Suto Bros. Braid Co., Weehawken, N. J.; The Quissett Mills, New Bedford, Mass.; Berkeley Co., Providence, R. I.

KOERTING SPRAY METHOD OF OILING WOOL.

A system of spraying oil on wool, which has been successfully employed to quite an extent in Europe, is illustrated herewith. The Koerting spray nozzle, manufactured by the Schutte & Koerting Co., Philadelphia, Pa., which is widely used for recooling condensed water and also in connection with humidifying, is the apparatus employed.

In order to treat in the spinning mills wool, yarn or vigogne with the suitable oil mixture in a satisfactory manner, the spray nozzle attachment is connected to the picker, as shown at Fig. 1. This device comprises three spray nozzles, one on either side, and one in the center, the latter being connected somewhat higher than the other two. Either the two lower or the upper nozzle is used. The quantity of oil sprayed is regulated by varying the pressure. The pressure pipe conveying the oil to the nozzles is so arranged that a part of the oil is constantly returned to the tank to keep up a circulation of the liquid, since otherwise the mixture would not be of the necessary uniformity.

A steam jet apparatus is provided in the tank so as to keep the material warm and liquid. A belt driven pump is generally used for forcing the oil from the tank to the nozzles. If preferred, a suitable steam driven pump is furnished with this outfit.

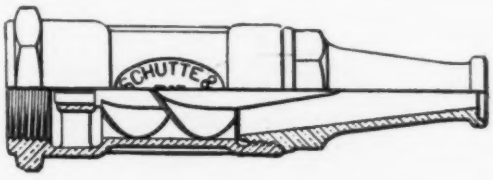


FIG. 2. SECTION OF SPRAY NOZZLE BOTTOM.

Fig. 2 shows the Koerting centrifugal spray nozzle on a larger scale.

The total value of the exports during April, 1910, to the United States from Huddersfield was $128,580 as compared with $178,110 in 1909 and $54,880 in 1908.

During the first two months of 1910 there were 9,429 tons of cotton goods exported from Germany, as compared with 8,200 tons during the same period of 1909.

There are over 17,000 children still at school employed in the English factories as half-timers in the cotton trade alone.

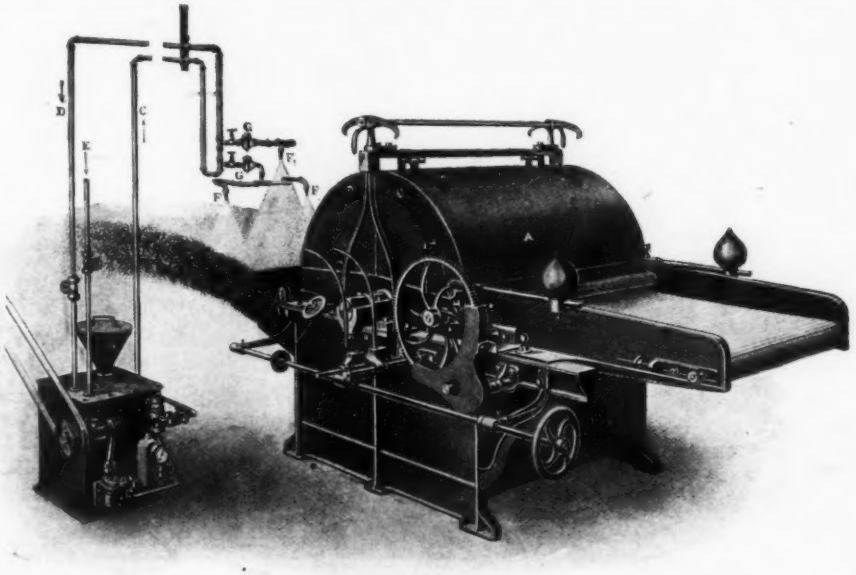


FIG. 1. KOERTING SPRAY NOZZLE ATTACHED TO WOOL PICKER.

THE MacCOLL SPOOLER GUIDE.

The illustration shows the MacColl spooler guide manufactured by the Draper Co., Hopedale, Mass., and which is the invention of J. R. and William B. MacColl. This device, which has been perfected at the Lorraine Mills, Pawtucket, R. I., will remove from the yarn during the process of spooling the slubs or bunches that will pass through other spooler guides. It will allow small piecings and knots which are unobjectionable to pass through; it will pluck loose slubs and imperfections from the yarn without breaking, holding the slubs in the teeth until they are cleaned; it is easily set, cleaned and adjusted; it requires less frequent adjusting than other guides as it works with a larger opening. On worsted yarns the production in after processes is greatly increased, as the yarn is delivered practically free from slubs and it is unnecessary to stop continually to remove these imperfections.

MAC COLL SPOOLER GUIDE—PATTERN FOR COTTON.

The guide is made for either cotton or worsted yarn, the illustration showing the pattern for cotton.

Of the total supply of cotton for the six months ending February 28, 1910, amounting to 11,575,330 bales, 2,539,399 bales were consumed in this country; 4,599,682 bales were exported; while 4,436,249 bales remained in the United States at the close of the period.

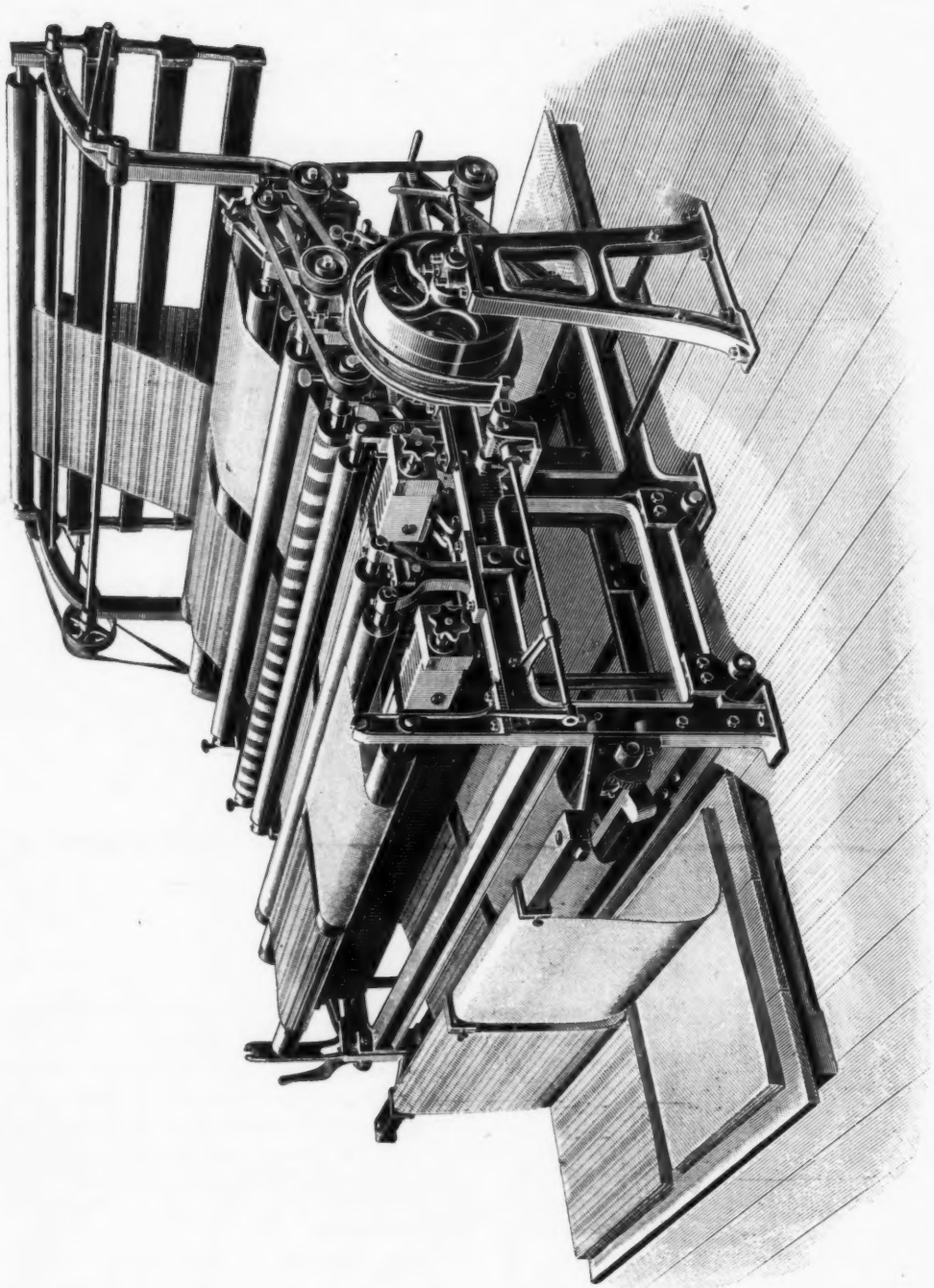
THE UNIVERSAL CLOTH CLEANING MACHINE.

This machine, for which A. W. Buhlmann, 487 Broadway, New York, is the American agent, removes knots, shives, loops, lumps, slings, remnants of straw and other foreign matter from the surface of woven goods. The cleaning is done by two knives, two spiral grinding rollers and two brushing rollers. Both sides of the goods can be cleaned by one passage. Any of the knives, grinding rollers or brushing rolls can be set out of action to suit the character of the weave to be treated. The goods can be treated on one side only and two pieces of narrow goods can be treated simultaneously. Each of the working parts are provided with an adjustable scale to regulate their action.

The cleaning knives are arranged on latches, the scales facing each other. They can be set at different angles to each other to suit the quality of goods to be treated. This is done by means of a hand-wheel, while a scale facilitates a correct setting of the knife instrument, indicating the angle. The edges of the knives are finely scalloped.

The cleaning parts are placed on two supports producing a swinging motion, which is obtained by means of levers and cams. They move back and forth in an arc on the surface of the cloth and remove all the objectionable parts. The cloth passes over expansion rollers before it reaches the cleaning apparatus and is again expanded before being wound on the roller or folded.

The working of the machine is continuous, the pieces passing through without interruption. If a seam reaches the knives, the latter are lowered by means of a lever and without stopping the machine. The machine is well built, only the best materials being used. The side frames are connected with strong cross bars to avoid vibration. A special friction tension arrangement permits an accurate regulation of the tension of the cloth and the machine is provided with a tension device for the belt and a stopping arrangement in front and in the back of the machine. It is built in various sizes from 40 inches up to



THE UNIVERSAL CLOTH CLEANING MACHINE.

86 inches in width and has an average production of 2,500 yards per day for single pieces, and double this production, if two pieces are treated at the same time.

The main advantages claimed for the machine are as follows:

1. Very thorough cleaning of the goods.

2. Accurate regulation of the cleaning effect for the various qualities, with an extremely exact arrangement to regulate the action of the cleaning elements and the tension of the cloth.

3. Large production and easy attendance.

4. Goods in the worst condition are generally cleaned in one single passage.

5. In treating narrow goods, two pieces can be cleaned at the same time either on one side only or simultaneously on both sides.

6. The machine does not cut any holes and does not take any material out of the goods, as on ordinary shearing machines.

7. This process imparts a full, mild touch to the cloth.

We are informed that there are several hundred of these machines in successful operation in European plants and repeat orders are being constantly placed. Mr. Buhlmann has a large number of testimonials from European manufacturers who are using this cleaning machine, and will be pleased to show them and give further information on application.

POWER FOR DRIVING MULES.

By H. S. HUBBELL, of the T. R. Almond Mfg. Co., Ashburnham, Mass.

An interesting test was recently made at the Orswell Mills to determine the power consumed in the operation of a number of mules. The motor tested was a 50 h. p. General Electric machine; speed, 900; amperes, 50; volts, 550. The motor was belted to a main counter shaft by an 11-inch belt. From the main counter shaft belts led to the counter shaft immediately over the mule head of each of the four mules.

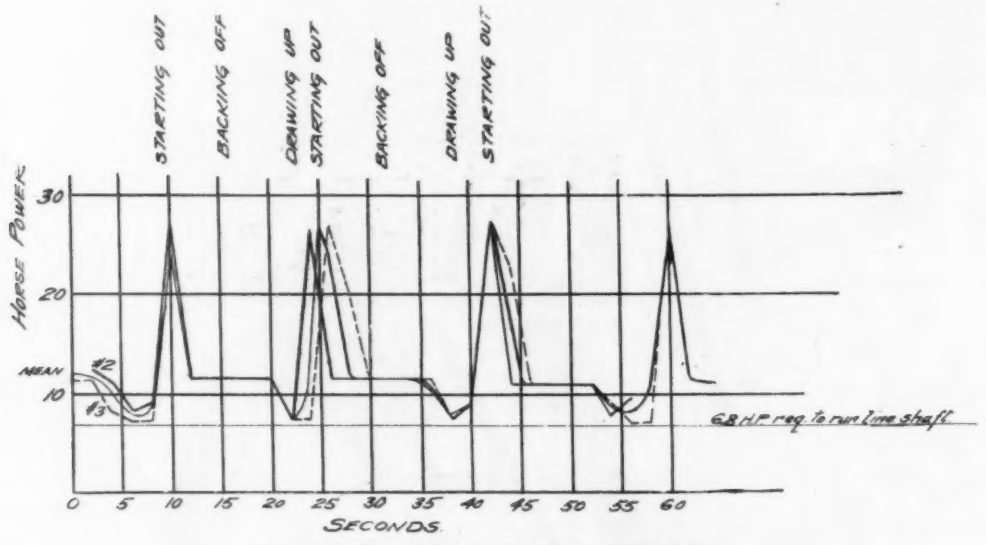


FIG. 1. CHART SHOWING POWER TEST FOR SINGLE MULE.

The mules were built by the Dobson & Barlow Co., operating on Sea Island cotton. There were 776 spindles on each machine. The spindle speed was figured at 8,880 r. p. m.; the spindle gauge was 1 3/8 inches. The length of cop was 7 by 1 1/4 inches wide filled.

Hank number, 18; yarn number, 90.

Speed of front roll, 187 revolutions per draw.

Diameter of front roll, 1 1/8 inches.

Speed of back roll, 1 1/2 inches revolutions per draw.

Diameter of back roll, 1 1/8 inches.

Speed of cylinder, 1,277 r. p. m. figured.

Diameter of cylinder, 6 inches.

Diameter of whirl, 7/8 inch.

Length of stretch, 60 inches.

The carriage made four complete trips in 73 seconds.

required for the greater part of the time is a little more than 11 h. p. as shown by the practically horizontal line extending nearly the whole distance between the peaks, except for the sudden dip during the "drawing up" operation, but it must be borne in mind that the maximum of 27 h. p. occurs four times per minute.

Fig. 2 shows a test of two mules. At the beginning of the test both mules were

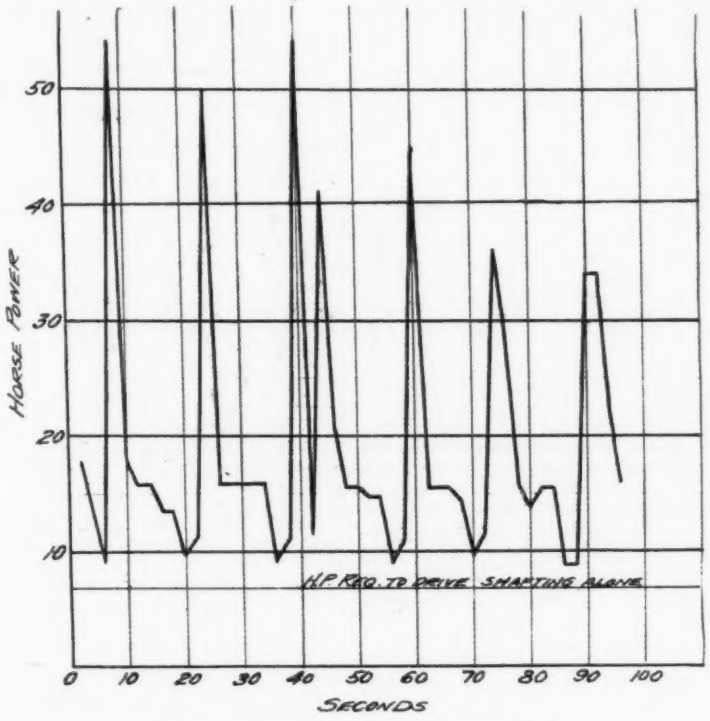


FIG. 2. SHOWING POWER TEST FOR TWO MULES.

The h. p. required to drive the line shafting with all of the mules stopped, 6.8 h. p.

It is to be noted that h. p. figures show power delivered by the motor and that they are figured by a slide rule assuming 85 per cent. motor efficiency, and that readings are as near accurate as possible with so fluctuating a load.

Fig. 1, a test of a single mule, shows that the load varies from a minimum of 7 h. p. to a maximum of 27 h. p. at intervals of about 15 seconds. The amount of power

"started out" together, the load rising to nearly 60 h. p. The peaks drop rapidly, due to the mules getting out of step so that after about 1 1/2 minutes the maximum power required is about 34 h. p. and averages to occur every 7 to 8 seconds, or eight times per minute. The curve is not plotted further, but if it were continued would show a fairly steady maximum of 30 to 35 h. p., working up to an occasional peak somewhat higher. The two mules would, of course, at times both "start out" together, but this

extremely high peak would be infrequent. The continued curve is regular the same as in Fig. 3, which is a test of four mules taken at random. Here there is, at 25 seconds, a peak higher than the most frequent peaks and again at 60 seconds the curve is rising to a still higher point.

The reason for the tests being made was the failure of a No. 3 Almond right angle transmission to drive two mules. This drive is fitted regularly with 20 by 9 pulleys and at a speed of 300 r. p. m. will satisfactorily transmit 20 h. p. The transmission was installed to drive the two mules shown in the test, Fig. 2, where there is a maximum load of 30 to 35 h. p. called for every 7 to 8 seconds. Of course the extreme load is practically instantaneous, but when it is considered that this maximum occurs eight times per minute it is not reasonable to expect a 20 h. p. transmission to give satisfaction when subjected to so great and so frequent overloads.

From the results of this test and the experience and practice of a manufacturer of electric motors it would seem that the addition of a fly wheel, 30 inches diameter, weighing 600 pounds, at the counter shaft directly over each mule head would take care of the momentary demands for excessive power, reducing the maximum power required to 16 to 18 h. p., so that No. 3 transmission would satisfactorily carry the load.

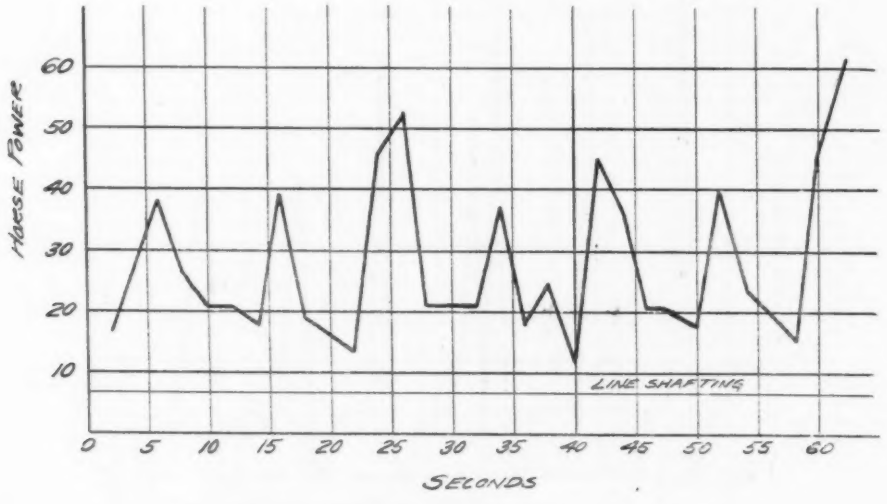


FIG. 3. SHOWING POWER TEST FOR FOUR MULES.

MILL NEWS.

South Carolina, Union. L. L. Wagnon contemplates starting a waste mill in Union and is interested in information on necessary equipment. Mr. Wagnon also contemplates establishing an overall factory. He may be addressed, Care of Union Grocery Co., Union, S. C.

South Dakota, Sioux Falls. Wm. Appleyard has made a proposition to the Commercial Club to start a woolen manufacturing industry in the old woolen mill which it is said has been idle for over 20 years. The plan is to purchase the woolen mill property, enlarge and remodel the buildings and install new machinery. A later report states that Mr. Appleyard and the Commercial Club have agreed upon terms and that the property has been bought and will be repaired immediately.

Tennessee, Chattanooga. The Eastern Tennessee Power Co. of Polk County has been incorporated with capital stock of $1,750.000 to produce electric power for manufacturing purposes. A water power plant is to be built near Parksville on the Ocoee River.

*Tennessee, Erwin. No details have been arranged for building the Erwin Cotton Mill, recently mentioned. W. C. Heath of Charlotte is largely interested in the proposed cotton mill, and controls the new Nolachukey Power Co. which will supply power to the mill when built.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

New Mills.

*Massachusetts, Fall River. It is proposed by the management of the new Charlton Mills to push the weave shed to completion as early as possible and to begin operations with yarn bought in the market. The power plant will also be rushed to supply electricity to operate the weaving department.

*Massachusetts, New Bedford. Contract for building the plant of the Sharp Mfg. Co. at the corner of Rockdale Ave. and Dartmouth St. has been awarded to J. J. Prindiville Co. of South Framingham, Mass. The main mill will be 565 by 136 ft., 5 stories high. The engine room will be 122 by 160 ft. The boiler room will be 164 by 141 ft. Besides the main mill and power department there will be a large storehouse, 3 stories high, 70 by 316 ft. Ground has been broken and the work will be rushed so that the inside work may be finished during the winter.

*Massachusetts, New Bedford. Wm. L. Mauran of Providence, R. I., who is largely interested in the new Holmes Mfg. Co., will be president of the Booth Mfg. Co. F. R. Brown will be treasurer and Geo. H. Booth, agent. Charles W. Praray, who designed the Holmes Mfg. Co.'s plant, has plans in preparation for buildings to be equipped with 50,000 spindles and about 1,500 looms, including a spinning mill, weave shed and power house. A site has not been definitely decided upon, but option has been secured on a tract of land near Cove Village in Dartmouth, owned by Daniel Sweeney. The new company will be capitalized for $1,250,000, classified as $500,000 common stock and $750,000 of 6 per cent. cumulative, preferred stock. The preferred stock may be called in and cancelled in whole or in part any time after December 31, 1914, at $125 per share. There is a good demand for shares in the new company and buildings will be started during the first part of August. It is hoped to have the buildings enclosed before cold weather. The products of the mill will be fine cotton fabrics which will be sold direct to the trade.

*North Carolina, King's Mountain. Construction work is nearly finished on the new Pauline Mill. Thirty-two jacquard looms are to be installed for weaving damasks.

*North Carolina, Salisbury. Gilbert F. Hambley is making very good progress on the damask mill project and expects to begin to build about August 1 and to begin manufacturing about Jan. 1, 1911. Damask table cloths will be the sole product and the equipment will consist of 50 looms to be run by electric power. They will buy warp on beams and filling on cones.

*North Carolina, Vass. Several months ago, August Cameron, a lumberman of Vass, erected buildings for a cotton mill. Later he organized the Vass Cotton Mill Co. with authorized capital stock of $250,000 to operate the mill, and about $75,000 has been paid in. Walter B. Bell of Morganton has become associated with Mr. Vass in the enterprise and contract has just been awarded for machinery equipment, including 5,000 spindles, electric power equipment, etc. They will make 30s to 45s yarns on cones, tubes and in skeins, and expect to set up the machinery and begin the production of yarns about November 1. Mr. Bell will move to Vass and take the active management of the company. August Cameron is president and largest stockholder of the corporation and Walter Bell is secretary, treasurer and general manager.

*Oklahoma, Oklahoma City. It is said plans and specifications for the proposed plant of the Oklahoma Bag & Cotton Mills Co. are being rapidly completed and immediate action is to be taken to begin construction of necessary buildings. A meeting will be held shortly to effect a permanent organization.

South Carolina, Belton. E. B. Rice, Jr., has installed 10 looms, electric power equipment, etc., for manufacturing Turkish towels and doilies and will operate under the style of E. B. R. Weave Shed.

*South Carolina, Chesnee. Work has begun on putting in a siding from the C. C. & O. Lines to the site of the proposed Chesnes Mills and contract for buildings will be let within a few days. It is expected the mill will be completed within 8 months and will be in operation inside of a year. This is to be a 20,000 to 25,000-spindle plant for making fine lawns. W. E. Burnett, president of the First National Bank of Spartanburg, is president and treasurer, and J. N. Cudd, also of Spartanburg, is vice-president and general manager.

*South Carolina, Great Falls. Hal B. Mebane, secretary and treasurer of the Republic Cotton Mills, now under construction, advises that they expect to begin manufacturing about December 1 and will make print cloths on initial equipment of 25,200 spindles and 650 looms, operated by electric power. As noted previously, all contracts have been placed and construction work is in progress. Robt. S. Mebane is president and Deaver Little, superintendent.

*South Carolina, Greenwood. Work has been started on the Panola Cotton Mills by J. L. Masters of Anderson, the contractor in charge. A

spur track from the Southern Railway has been completed and there is nothing to delay the completion of the buildings in 5 months, the time set by president F. S. Evans for putting up buildings. The site adjoins the new Grendel Mill No. 2 and is a favorable location for manufacturing.

*South Carolina, Laurens. J. Adger Smith, Jr., president and treasurer of the Watts Mills, advises that nothing has been done as yet regarding the Connemara Mills except to make application for a charter. The size of the plant has not been decided upon nor has a final decision been made on the exact class of goods to be made. The capital stock of the new corporation is $400,000.

South Carolina, Newberry. Geo. W. Sumner, president of the Mollohon Mfg. Co. of Newberry, states that the proposed new mill will be built in the next year, but beyond the statement that organization will be completed and buildings started soon, no report can be made at the present time.

*Texas, McKinney. Good progress has been made on the plant of the Lone Star Cotton Mill and it is expected the production of goods will begin about Sept. 15. Shirtings, tickings, ginghams and chambrays will be manufactured.

Enlargements and Improvements.

Connecticut, Killingly. Preparations are being made by the Attawaugan Co. to change over to electric power. A new 700 h. p. engine and generator have been ordered and will supply power and light. It is expected the change will be completed by October 1.

*Kentucky, Louisville. No change will be made by the Puritan Cordage Mills beyond an addition to the finishing department and all machinery supplies for this have been purchased. The company has 20 sets of cards and 2,500 ring spindles. They manufacture cotton sash cord, rope and clothes lines, employing 104 hands. Chas. T. Wolfe is president; Geo. W. Babcock is treasurer, and C. L. Sweet is superintendent. Chas. T. Wolfe and C. L. Sweet attend to the buying.

Massachusetts, Lowell. Within a short time the Boott Mills will erect a steam turbine house on the site now occupied by the boiler house and the present engine room will be rebuilt to accommodate new apparatus.

Massachusetts, Lowell. Four new upright boilers are being installed by the Appleton Co. and will add about 1800 h. p. to the capacity of the mill.

*Massachusetts, New Bedford. The addition to the weave shed of the Taber Mill, Inc., is nearing completion and the installation of machinery will be begun at an early date.

Massachusetts, Northbridge. Paul Whitin Mfg. Co. has started a cotton waste department for manufacturing twines from cotton waste.

Massachusetts, South Acton. Additional cards have been installed by the South Acton Woolen Co., manufacturers of shoddy and wool extracts. The mill is running in full.

New York, Capron. The new Sauquoit Spinning Co., which took over the plant of the old Utica Cotton Co., will begin manufacturing about October 1. Practically all the old equipment has been disposed of and new machinery is being installed which includes 16,000 mule and ring spindles for making combed and carded yarns, 12s to 45s, single and two ply. All the old looms of the Utica Cotton Co. have been disposed of and no weaving will be done hereafter. W. J. Frisbie is president of the new company, Geo. A. Frisbie, treasurer, and Wm. H. Merriman, superintendent and buyer.

New York, Cohoes. In connection with the extensive changes that are being made in the Harmony Mills, the entire plant will be closed next week to facilitate the moving of machinery in Mills 1 and 2 and the setting up of machinery in Mill No. 3. A bridge is being built to connect Mills 1 and 2, which will be completed in about 10 days.

*North Carolina, Durham. New machinery equipment is to be installed in the 3-story addition under construction for the Golden Belt Mfg. Co. This enlargement to the bag factory is to take care of the increase in business.

*North Carolina, Monbo. Work on the new mill for the Turner Mills Co. at East Monbo has been completed and the mill is ready for machinery which is being received. The building is 80 by 300 ft., 2 stories high and will have 10,240 spindles for making 40s to 60s yarns. Recently the Turner Mills Co. and the Monbo Mfg. Co. of Monbo were consolidated and the capital stock increased to $350,000. W. B. Turner is president; C. L. Turner, treasurer and general manager and J. L. Turner, superintendent.

North Carolina, Salisbury. An addition will be built to the weaving department of the Salisbury Cotton Mills of brick construction, 1 story high, 74 by 80 ft. Eighty new looms are to be installed. The present equipment is 21,500 ring spindles and 590 looms operated on colored cotton goods and chain warps.

*South Carolina, Gaffney. The capital stock of the Hamrick Mills has been increased from $150,000 to $250,000. It has been reported previously that a 2-story brick mill would be built and equipped with 15,000 spindles and 364 looms, which have been ordered.

South Carolina, Lando. The only enlargement to be made at present by the Manetta Mills consists of the installation of 40 new looms.

*South Carolina, Simpsonville. Construction work has been started on the new mill for the Simpsonville Cotton Mills, which will be 2 stories high, 132 by 290 ft.

Texas, Cuero. At a meeting of the stockholders of the Cuero Cotton Factory, it was decided to raise $50,000 to repair and enlarge the plant and make an effort to put it on a paying basis. The manager of the local electric light plant is quoted as saying his company will subscribe $23,000 of the required amount. An experienced cotton mill man will be secured when the mill is started up

and every effort put forth to begin work under as favorable conditions as possible. Last January the property was offered for sale, the price asked being $85,000. Last November Mr. Otto Buchel, formerly treasurer of the company, died, and on account of ill health Mr. Reiffert, who had been connected with the active management of the mill, was incapable of continuing the business.

WOOLEN.

New Mills.

Ohio, Cleveland. The Eureka Worsted Mills Co., incorporated in April with capital stock of $100,000, has organized with the following officers: Wm. S. Thorpe, president; M. G. Corbley, vice-president; M. J. Flannagan, secretary and treasurer. It is proposed to manufacture knitting yarns for the present and later to install a weaving department. Mr. Flannagan was formerly connected with the Cleveland Worsted Mills Co.

*Pennsylvania, Erie. There is no connection between the new John Tauber Woolen Mills of Erie, and the Tauber Woolen Mills of Spartansburg. John Tauber is sole owner of the new company and will make wool batting for comfort makers and do scouring and carding, operating 5 cards. Later a comfort making department is to be added.

Pennsylvania, Philadelphia. Thos. A. Taylor is establishing the Comet Spinning Co. on the top floor of the building at the S. E. corner of Howard and Berke Sts. Woolen and merino yarns for weaving and knitting, up to 35 cut, will be made on 2 sets of cards and 1,600 spindles. John Haney will be superintendent of manufacturing. The product will be sold direct.

Pennsylvania, Philadelphia. A charter has been asked for the Dresden Carpet Co., with James G. Speck, Edward C. Read, Sr. and Edw. C. Read, Jr., as incorporators. This company, which has a capital of $30,000, will take over and operate the plant, started up about a year ago at Richmond and Pacific Sts., by the Interlined Rug Co., an incorporated company with a capital of $20,000 with offices in the Drexel Building. The plant, which now contains 8 looms, will be augmented by an installation of 20 additional looms, which will be run on a patented rug. The Messrs. Read, who are interested in the new concern, are now engaged in the manufacture of ingrain carpets and rugs at 1720 Hope St., where they are operating 62 looms.

*Rhode Island, Woonsocket. Contract has been awarded by the new Samoset Worsted Mills for wiring, installation of lights and electric power equipment. As noted previously, power is to be supplied the Samoset Worsted Mills and the Nyanza Mills by the Manufacturers' Power Co., controlled by the same interests.

Enlargements and Improvements.

Connecticut, Mechanicsville. Ground has been broken for the new weave shed of the French River Textile Co., which is to be 165 by 95 ft. and will be equipped with 100 looms. The addition was made necessary on account of the increase in the business of the company and it is estimated will give employment to about 100 additional hands.

Connecticut, Shelton. A small addition to Mill No. 2 of Sidney Blumenthal & Co., Inc., has been started. A larger addition to Mill No. 1 is under way.

Connecticut, Stafford Springs. A new dresser is being installed by the Warren Woolen Co. and 30 new looms will be put in to replace old looms. It was formerly thought that the mill would shut down while the changes were made, but the management does not believe it will be necessary to close.

*Connecticut, Unionville. The new branch mill of J. Broadbent & Son is being started with 2 sets of 60-inch cards and 3 mules. Hosiery knitting yarns will be the sole products for the present.

Illinois, Hanover. A new picker house, 60 ft. square, is being built by the Hanover Woolen Mfg. Co.

Kansas, Topeka. About $10,000 has been expended by the Western Woolen Mill Co. for new equipment. The old machinery equipment is being overhauled and repaired. The company now employs 44 hands, but this number will be increased when the new equipment is running.

Massachusetts, Auburn. Plans have been completed for an addition to the dye house of the Ettrick Mills, to be of brick construction, 1 story high, with tar and gravel roof. Contract for construction work has been awarded to E. D. Ward.

Massachusetts, Farnumsville. The new office building to be built for the Wuskanut Mill, operated by S. Slater & Sons, Inc., Webster, Mass., will be of wood construction, 28 by 30 ft., 1 1/2 stories high. Upon completion of the new building, the space in which the offices were formerly located will be added to the finishing and shipping rooms.

Massachusetts, Lawrence. The Pacific Mills expect to complete the new worsted department before November 1. The yarn mill is 550 ft. long, 130 ft. wide, 6 stories high with basement. The weave shed is 560 ft. long and about 150 ft. wide, 1 story high with basement. 1,084 wide looms are to be installed in the new weave shed.

*Massachusetts, North Adams. Strong, Hewat & Co. have awarded contract for their addition to Whitney Bros. and construction work will be started next week. It is understood the new quarters will be ready for use by November. As noted previously, the new space will be used largely for offices and storerooms.

*Massachusetts, Plymouth. Equipment for yarn and piece dyeing is to be installed in the new dye house of the Standish Worsted Co., now under construction. B. F. Mellor is president and buyer.

Massachusetts, South Royalston. Work has been pushed on the addition to the Royalston Mill

(American Woolen Co.) and it is understood all departments will be started up in the fall. The new chimney, a part of which fell while under construction, has been repaired.

*Massachusetts, Ware. The Geo. H. Gilbert Mfg. Co. has been short of storage room for their wool and the addition under construction is for the purpose of providing additional storage space.

New Hampshire, Gonic. A fireproof storehouse, 75 by 40 ft., will be built for the Gonic Mfg. Co. to replace the old storehouse. The mill is shut down for the annual vacation of three weeks.

New Hampshire, Keene. The mill of the Faulkner & Colony Mfg. Co. has shut down for repairs and to allow of installation of some additional equipment.

New York, Newburgh. The Stroock Felt Mills have nearly finished a concrete addition, 100 by 70 ft., and are now building a new office, 60 by 30 ft.

North Carolina, Lumberton. Work has just been completed on a raw stock dye house of concrete construction for the Lumberton Cotton Mills. Waste and yarns also will be dyed.

Pennsylvania, Lenni Mills. About July 1 the Yorkshire Worsted Mills will start up the looms recently moved to Lenni Mills from the Philadelphia annex. A mill building has been completed, also a new dye house, storehouse and power plant.

Pennsylvania, New Cumberland. Among other improvements the Susquehanna Woolen Co. will change from steam to electric power. A building will be erected for power plant and equipped with a 150-h. p. boiler, engine and generator to supply electric power and light.

Pennsylvania, Philadelphia. The contract for ting Co., manufacturers of men's, children's and 50 by 230 ft., has been given out by Joseph Greer, manufacturer of woolens and worsteds on 365 looms in Frankford. The new building, which will be used as an addition to his present plant, will be located at Church and Tacony Sts., and will cost in the neighborhood of $24,000.

Pennsylvania, Woolrich. The new addition to the plant of John Rich & Bros., which was started last March, is to enlarge the cloth department and will be used for manufacturing heavy and light all wool flannels, 4 to 14 ounces, 28 inches wide. The new equipment to be installed consists of 2 sets of cards and 1,200 spindles, and the number of looms in the plant is to be increased to 40. All the new machinery will be set up and in operation about Sept. 1. W. F. Rich, E. C. Tobias and R. F. Rich superintend the plant and attend to the buying.

West Virginia, Martinsburg. A new sprinkler system with capacity of a thousand gallons a minute is being installed by the Crawford Woolen Co. This improvement is expected to be completed in about 60 days.

Mills Starting Up.

Kansas, Topeka. Manufacturing has been resumed by the Western Woolen Mill Co. on cassimeres. About $10,000 worth of machinery has been added and they now have 3 sets of cards and 15 looms with complementary machinery. E. H. Crosby is president; J. R. Burrows, treasurer; J. F. McAfee, superintendent and buyer. Curtiss & Warren are the selling agents.

Massachusetts, Pittsfield. On August 1, D. T. Noonan, superintendent of the Berkshire Woolen & Worsted Co., the new company which has taken over and will operate the upper mill of J. L. & T. D. Peck Mfg. Co., will remove to Pittsfield from Dexter, Me., and start work immediately in getting out a line of samples. It is hoped to have the mill in full operation early in the fall. The plant has been closed down for more than a year.

*Utah, Provo. Manaufacturing will be started in the Provo Woolen Mills some time in September under the style of the Knight Woolen Co. A charter has been secured by the new corporation with capital stock of $150,000, divided into 2,000 shares, par value $75. Jesse Knight holds 370 shares, J. Wm. Knight, 10 shares, R. E. Allen, 10 shares, W. Lester Mangun, 10 shares, Thos. N. Taylor, 10 shares, treasury stock, 1,580 shares. The Provo Woolen Mills were recently purchased by Mr. Knight for $30,500 and are taken over at valuation of $30,000. The officers of the new company are Jesse Knight, president; J. Wm. Knight, vice-president; Royal J. Murdock, secretary and treasurer, and W. Lester Mangun, R. E. Allen and Thos. N. Taylor, directors. James Dow, formerly connected with the Dumbarton Woolen Mills, Dexter, Me., has been engaged to act as superintendent.

*Wisconsin, Avalanche. L. H. Stickler has purchased the Avalanche Woolen Mills and has begun manufacturing yarns, flannels, blankets, batting and wool stockings. The plant contains 1 set of cards and 2 looms, steam and water power equipment, and a dye house.

SILK.

New Mills.

California, San Diego. The California Silk Mills have started a plant at 5th Ave. and Elm St. A building has been completed and equipped with looms, warping machinery, etc., to make silk dress goods, broad silks, handkerchiefs, ties and silk specialties. Wm. H. Hibbard is president; Chas. N. Andrews, secretary, and Wm. Hilton, superintendent.

New Jersey, Alpha. John Ramsay & Sons, manufacturers of silk thread at Phillipsburg, N. J., and Easton, Pa., will shortly organize the Alpha Silk Co. and build a mill 55 by 200 ft. Sufficient bonds are said to have been sold to insure the starting of the plant.

Enlargements and Improvements.

*Massachusetts, Florence. The Flint Construction Co. has begun work on the addition to the spun silk mill of the Nonotuck Silk Co. at Leeds.

New Jersey, Paterson. Wolff & Silber have added 10 new looms to their plant. They report a very good business on warp print broad silks.

New Jersey, Paterson. Some changes are in contemplation by the Haledon Throwing Co., including the erection of an addition to the Paterson plant and the removal of the machinery from Oxford Furnace to Paterson.

Pennsylvania, Altoona. The new mill being built here for The Schwarzenbach-Huber Co. will be equipped with looms only. Auxiliary machinery at the other mills will supply the warps, etc.

Pennsylvania, Lenni Mills. In the near future the Victoria Plush Mills will build an enlargement to their branch here. A short time ago the branch finishing plant at Paterson, N. J., was discontinued, the equipment being removed to Lenni Mills. The main mill and office is at Swarthmore, Pa.

Pennsylvania, Scranton. A 3-story addition has been built to the plant of the W. A. Lush Silk Co. at a cost of $7,000 and machinery will be installed at once at a cost of about $18,000, enabling them to make a large increase in the capacity and to give a total production of about 3,500 pounds per week. The capital stock of the company is $50,000. David R. John is president; W. A. Lush, treasurer, agent and buyer, and Wm. Marsden is superintendent. The plant is operated by electric power.

*Rhode Island, Providence. Additional machinery is being installed to increase the production of the American Silk Spinning Co. This is the only change being made and reports that an addition will be built are incorrect.

MISCELLANEOUS.

Connecticut, Bridgeport. Bids have been received for a weave shed to be erected at the plant of Alb. and E. Henkels on Connecticut Ave. The structure will be 1 story high, brick and steel construction, 60 by 190 ft., with gravel roof. It is expected the contract will be let at once.

*Connecticut, New Haven. The Pond Lily Co. contemplates building two additions, as noted in an earlier report, but plans have not been decided upon as yet.

Illinois, Zion City. During the present year machinery will be imported by Marshall Field & Co. for the Zion Lace Works, which will more than double the capacity. In addition to laces and lace curtains, bed spreads and cotton tapes are manufactured at the Zion Lace Works.

*Massachusetts, Assonet. Foundations for the new Puritan Waste Mills are now being put in and the officers expect to have the building completed and the machinery ready for operation by Nov. 1. A storehouse, 100 by 40 ft., is to be erected on the opposite side of the river from the main building.

*Massachusetts, Gardner. Good progress is being made in putting the factory building in shape for the East Brook Co. and the directors plan to begin operations in the early fall.

*Massachusetts, Lawrence. Workmen are engaged in making excavations for the new building to be constructed on the site of the National Fiber Board Co. of South Lawrence by the Lawrence Dye Works Co. The building will be much larger than the original building on the site, and the old boiler house will be removed and a new one constructed. A new chimney 200 ft. high will be built. It is said the mill is to be a 4-story structure.

Massachusetts, Lowell. The Pacific Mills of Lawrence have bought the print works department of the Hamilton Mfg. Co. and the transfer will be made at once, the machinery being removed to Lawrence. A new mill is to be erected in the Hamilton yard and a modern city business block will be built on the Hamilton property on Central St. These improvements will not be made at once, however. The result of the change will be an enlargement of both the Pacific Mills and the Hamilton Mfg. Co.

Massachusetts, Methuen. The Carribee Mfg. Co. has been incorporated with capital stock of $25,000 for the purpose of manufacturing narrow fabrics and tapes of all kinds. L. E. Barnes is president; J. D. Armitage, treasurer, and Wallace Major, secretary. A plant has been established in Methuen and an excellent business is being done.

*Massachusetts, North Brookfield. Bids for construction work on the new buildings for the Oxford Linen Mills are all in and contract will probably be let within a few days. The weave shed is to be of mill construction, 130 by 300 ft., with saw tooth roof. The bleach house will be of brick and steel construction, 60 by 150 ft. The finishing building will be of reinforced concrete and steel, 60 by 127 ft. B. S. Brown, 161 Devonshire St., Boston, is the engineer.

New Jersey, New Durham. The addition being made by Frank F. Pels & Co. is for the Pels' Bleaching Co., owned by Frank F. Pels & Co. This concern bleaches fine lawns, all jacquard work. The addition is 150 ft. long and 2 stories high. They are also adding a new boiler house.

Pennsylvania, Philadelphia. The T. A. Harris Co., dyers of cotton and woolen yarns, knit goods and hosiery at 147 West Thompson St., have recently purchased the properties at 151-53 W. Thompson St., measuring 31 by 70 ft., for the sum of $5,000. These buildings adjoin their present plant, which is known as the Continental Dye Works and will probably be used for enlarging the plant.

Pennsylvania, Philadelphia. A contract has been given out for the erection of a two-story addition, 50 by 77 ft., to the factory of Sibson & Stern, Inc., on Stenton Ave. below Wyoming St., Wayne Junction, at an estimated cost of $15,000. This company is manufacturing a line of lace trimmings for the knitted underwear trade and at this time is very busy. The new addition will enable them to increase their plant.

*Pennsylvania, Philadelphia. The American Viscose Co. has awarded contract for the building of a pump house, reservoir and storage tanks to be used in connection with its artificial silk manufacturing plant now being erected at Marcus Hook, Pa.

Pennsylvania, Philadelphia. The Steel Heddle Manufacturing Co., 2110-18 West Allegheny Ave., whose plant has been shut down for the past two weeks for the purpose of making extensive additions and repairs, are now in operation again and working to full capacity. Among other improvements the company has installed an electric power plant and added new machinery which has enabled them to double their capacity. They are manufacturers of steel harness and heddles.

*Rhode Island, Pawtucket. B. F. Smith Co., contractors, are working on the improvements at the Home Bleach & Dye Works, which include the erection of a new chimney 125 ft. high and 6 ft. in diameter, and a new water fountain with capacity of 103,000 gallons.

Rhode Island, Pawtucket. The Cadoza Lace Co. has been incorporated to manufacture and deal in lace and other textile fabrics with capital stock of $400,000. The incorporators are Emil J. Ozanne of Providence, Arthur Lecompt of Calais, France, and Henry E. Tiepke, Pawtucket. It is understood the new company will establish a lace plant in Pawtucket or vicinity.

Rhode Island, Providence. Articles of incorporation have been filed by the Tubular Woven Fabric Co. to manufacture and deal in elastic braided and woven fabrics. It is understood the plant will be located in Providence. The capital stock is $25,000 and the incorporators are Lewis A. Waterman, Irving O. Hunt and Ernest P. B. Atwood.

*Rhode Island, Providence. Improvements to be made to the power department of the Providence Dyeing, Bleaching & Calendering Co., 52 Valley St., include the erection of an addition to the boiler house, 65 by 45 ft. This will give room for 1,000 h. p. additional boiler capacity. The total capacity of the plant will be increased about 25 per cent.

Rhode Island, Providence. The new building being erected for Gerald Cooper on Pomfret St. is nearing completion and Mr. Cooper will move in as soon as the machinery can be installed. Most of the equipment will be new. Some of the old machines will be moved from the old plant at 235 Charles St., which will necessitate closing the plant for a few days. The new building, which will be used exclusively for mercerizing skein yarns, is 52 by 100 ft., 2 stories high, with separate engine and boiler house, 35 by 46 ft.

Wisconsin, Janesville. A 2-story factory building, 70 by 80 ft., will be built by the Janesville Batting Mills, manufacturers of cotton bats, to replace the plant destroyed by fire in February. The loss at that time was about $40,000, fully covered by insurance.

Wisconsin, Milwaukee. Four new looms are being added by the Cream City Net Co. and a further addition of 4 looms will be made within 3 months. Paul Holleback is superintendent of manufacturing.

Facts and Gossip.

*Delaware, Wilmington. The Rising Sun Knitting Co. is closed and the plant is in charge of Chas. Taylor, as receiver.

Indiana, Fort Wayne. The Old Fort Knitting Mills have increased the common stock from $100,000 to $150,000.

Indiana, South Bend. Officials of the Stephenson Underwear Mills were in Aurora, Ill., recently, conferring with business men and manufacturers regarding the removal of the Stephenson Underwear Mills to Aurora. In May the company completed plans for expending about $150,000 in enlarging their plant in South Bend, which included the construction of a new 4-story brick and concrete building and equipping of a yarn department. Later the company had difficulty with the Board of Public Works regarding the proposed enlargement and decided not to build at the present time. It is, therefore, probable that the company is looking for a new location where they may expand along the lines desired.

Massachusetts, Northampton. Some of the subscribers to stock of the proposed new hosiery company promoted by D. D. Evans of Springfield, have decided not to go into the venture. This is said to cause the delay in deciding on a site and beginning work on buildings. A large part of the capital comes from Springfield and it is now stated the plant may be located there.

Michigan, Grand Rapids. Articles of incorporation have been filed by the Swiss-American Knitting Works, the authorized capitalization being $85,000. The purpose is to take over the Clarke Knitting Co., which recently removed into a new building and made a large increase in the capacity.

Michigan, Rochester. There is no truth whatever in the report that the Western Knitting Mills of Rochester would build a factory in Owosso. They have been handicapped by the small amount of labor available in Rochester and wrote the Owosso Chamber of Commerce, asking if they could get from 100 to 150 girls. This gave rise to the report that they were to erect a large building in Owosso. The company states that if they did start a branch factory at Owosso, they would rent a building or loft where equipment could be set up to keep 50 or perhaps 100 girls busy, and would remove machinery from the mill at Rochester.

New Hampshire, Laconia. A building owned by the Belknap Mills Corp., manufacturers of hosiery, has been destroyed by fire with loss estimated at $2,500. No damage was done to the hosiery mill, however, as this building was rented to a laundry company.

Personals.

James Dow has accepted the position as general manager of the Provo Woolen Mills, Provo, Utah. He comes from the Dumbarton Mills, Dexter, Me.

Alfred Anderson, who recently accepted a position with the Darling Woolen Mills Company, Holliston, Mass., as overseer of finishing, has severed his connection with that company.

E. E. Bishop, overseer of weaving at the Monaghan Mills, Greenville, S. C., has resigned and on Sept. 1 will become superintendent of the new Alice Mills, Easley, S. C.

R. E. Estes, overseer of carding and spinning at the Brazos Valley Cotton Mills, West, Tex., has severed his connection with that company, to become overseer of spinning, spooling and warping at the Sherman Mfg. Company, Sherman, Tex.

W. A. East has been appointed overseer of carding and spinning at the Brazos Valley Mills, West, Tex. He comes from Brenham, Tex.

E. S. Summer has been appointed superintendent of the Alexander City Cotton Mills, Alexander City, Ala. He comes from the Montgomery Cotton Mills, Montgomery, Ala.

Cecil Arthur, overseer of spinning, spooling and warping at the Sherman Mfg. Company, Sherman, Tex., has severed his connection with that company.

C. S. Wilkinson has been promoted from overseer of weaving to superintendent of the Dwight Mfg. Company, Alabama City, Ala.

Lewis W. King, overseer of carding at the Cowikee Mills, Eufaula, Ala., has resigned to accept the superintendency of the Marble City Mills, Sylacauga, Ala., succeeding H. Smith, who resigned.

Christian Burger has accepted the position as loom fixer at the American Felt Company, Glenville, Conn. He comes from North Andover, Mass.

Austin B. Green, overseer of carding at the Orrell Mills, Glendale, R. I., has severed his connection with that company.

E. Collins, Jr., secretary and superintendent of the Sauquoit Silk Co., Philadelphia, has resigned and will take a much needed rest before making any definite plans for the future.

Emil Coene, who recently resigned as secretary and superintendent of the Haledon Tapestry Co., Paterson, N. J., has been engaged by the Salt's Textile Mfg. Co., Norwalk, Conn.

Charles McCarthy, assistant superintendent at the Old Town Woolen Company, Old Town, Me., has accepted the position as superintendent of the Oakland Mfg. Company, Reisertown, Md.

J. T. Patterson, for the past 4 1/2 years overseer of finishing at the Washington Mills, American Woolen Co., Lawrence, Mass., has severed his connection with that company. Mr. Patterson will take a much needed rest before engaging elsewhere.

J. H. Lord, superintendent of the Atlanta Woolen Mills, Atlanta, Ga., has resigned and is succeeded by Preston Gsell.

J. D. Melton has accepted a position as master mechanic at the Mecklenburg Mills, Charlotte, N. C. He formerly held a similar position at Weldon, N. C.

C. E. Bixby has accepted the position of chief engineer and master mechanic at the Gainesville Cotton Mills, Gainesville, Ga. He comes from Atlanta, Ga.

G. E. Foster has been appointed overseer of the cloth room at the Manchester Cotton Mills, Manchester, Ga. He comes from Lindale, Ga.

W. H. Ramsey has accepted a position as overseer of spinning at the Maple Mill, Dillon, S. C. He comes from McColl, S. C.

J. B. Neeley has accepted the position as overseer of spinning at the Bellwill Cotton Mills, Wilmington, N. C. He comes from Dillon, S. C.

W. E. Williams has been promoted to the position of superintendent at the Tennille Yarn Mill, Tennille, Ga., succeeding Clifton Corley, who resigned. C. F. W. Kramer, secretary of this concern, has resigned to take effect July 1.

J. T. McGregor has been appointed superintendent of the Florence Cotton Mills, Forest City, N. C. He comes from Fort Mill, S. C.

J. C. Kellar has accepted a position as overseer of carding at the Locke Mills, Concord, N. C. He was formerly superintendent of the Lula Mill, King's Mountain, N. C.

John McCauley has accepted the position as overseer of finishing at the Garland Woolen Co., Staffordville, Conn. He comes from Putnam, Conn.

James Howard, overseer of wool sorting at the Talbot Mills, North Billerica, Mass., for the past 26 years, has finished his duties with that company. He is 72 years of age and the last of the old overseers who have been employed at this company for years.

John O'Brien, overseer of spinning at the Weybosset Mills, American Woolen Co., Providence, R. I., has severed his connection with that company to accept a similar position with the Pontoosuc Woolen Mfg. Co., Pittsfield, Mass. He is succeeded by John Campbell, who has been acting as second hand.

James H. Paton has been appointed wool buyer for the Amoskeag Mfg. Company, Manchester, N. H. He was formerly a wool broker with office at Boston, Mass.

James W. Cunliffe, superintendent of dyeing and finishing at the Wanskuck Mills, Providence, R. I.,

has left their employ to accept a position in a large dye works in Philadelphia.

Leroy Phelps, son of F. W. Phelps, superintendent of the Old Town Woolen Co., Old Town, Me., has been appointed assistant superintendent to succeed Chas. A. McCarthy.

John Ryan, overseer of carding and spinning at the Uncasville Mfg. Company, Versailles, Conn., has severed his connection with that company.

Herbert E. Meany has opened an office at 176 Federal St., Boston, Mass., in the general wool business. He will handle wool noils and waste and comes from Philadelphia, where he had been in business for several years.

Daniel Clark has accepted a position as overseer of finishing at the S. G. Hall Mfg. Company, Camden, Me.

Francis H. Silsbee, for 29 years superintendent of the Upper Pacific Mills, Lawrence, Mass., and Wm. H. McDavitt, for 21 years superintendent of the Pacific Yarn Mills, have resigned. Irving Southworth, a well known cotton mill man, and formerly superintendent of the Dwight Mfg. Company's mill at Alabama City, Ala., has accepted a position at the Pacific Mills and will superintend both mills, taking the position which these two men held.

Frank I. Henry has accepted the position as overseer of carding and spinning at the No. 2 Mill of the Thorndike Co., Thorndike, Mass. He was formerly employed at the Falls Co., Norwich, Conn.

Fred B. Hicks has been appointed head bookkeeper at the Somerset Worsted Co., Woonsocket, R. I. He was formerly assistant bookkeeper at the Dunn Worsted Mills, same city.

James Staples, for a number of years overseer of the spooling department at the No. 1 Mill of the Thorndike Co., West Warren, Mass., died at his home at Palmer, Mass.

E. N. Chace, overseer of the weaving department and assistant superintendent at the Falls Co., Norwich, Conn., who had been employed for this firm for 7 years and also 4 years at the Shetucket Co., same city, has resigned.

Geo. Smith has accepted the position as superintendent and designer at the Tremont Mills, Methuen, Mass. He comes from Westerly, R. I.

Henry Burke, assistant overseer of spinning at the Russell Mfg. Co., Pittsfield, Mass., has left the empioy of this company.

P. H. Manning, overseer of carding at the Wyandotte Worsted Co., Waterville, Me., has severed his connection with that company to accept a similar position with the Pondville Woolen Mills, Auburn, Mass.

Samuel Wilson, overseer of finishing at the S. G. Hall Mfg. Co., Camden, Me., has resigned.

Jos. H. Jones, master mechanic at the Burgess Mills, Pawtucket, R. I., has taken a similar position with the Maverick Mills, East Boston, Mass.

John J. Murphy, in charge of the dyeing and finishing at the Mann & Stevens Woolen Co., E. Brookfield, Mass., has severed his connection with that company to accept a similar position at Pittsfield, Mass.

James Hirst has been appointed superintendent of the Joseph Noone's Sons Co., Peterboro, N. H. He was formerly employed as superintendent for Harris & Co., Ltd., Rockwood, Ontario, Canada.

Clarence Caron has been appointed overseer of spinning for the Queen City Cotton Co., Burlington, Vt.

William Walsh has been appointed overseer of finishing for the Standish Worsted Co., Plymouth, Mass. He comes from Philadelphia, Pa.

James Patterson has been appointed overseer of finishing for the Franklin Mills, Franklin Falls, N. H. He recently resigned his position at the Washington Mills, Lawrence, Mass.

Austin B. Green has accepted position as overseer of carding for the Beoli Mills (American Woolen Co.), Fitchburg, Mass. He comes from Centreville, R. I.

Harry Taylor has been appointed overseer of dyeing for the Paton Mfg. Co., Sherbrooke, Quebec, Canada.

John Lucy, overseer of carding for H. T. Murdock & Co., Proctorsville, Vt., has resigned his position and accepted a similar position with the Pitman Mfg. Co., Laconia, N. H.

James Ryan, second hand in No. 4 Bennett Mills, New Bedford, Mass., has accepted position as overseer of spinning for the Standard Spinning Co., Oswego, N. Y.

Ward Brier has accepted the position as overseer of dyeing at the Merrimack Woolen Co., Lowell, Mass. He comes from Jamestown, N. Y.

Robert E. Jackson has resigned as overseer at the New York Mills, New York Mills, N. Y., to accept a position with the Sauquoit Silk Co., Capron, N. Y., and will assist in setting up the machinery at the new mill.

J. C. Wood, overseer of finishing at the Standish Worsted Co., Plymouth, Mass., has severed his connection with that company.

Chas. Jennings, overseer of carding for the Ray Mills, American Woolen Co., Franklin, Mass., has resigned to accept a position as superintendent of the yarn department at the River Spinning Co., Woonsocket, R. I. He is succeeded at the Ray Mills by Frank Morey of Uxbridge, Mass.

Joseph Brierly, who resigned his position as superintendent of the W. C. Plunkett & Sons Mill at Adams, Mass., and who accepted a position as assistant superintendent for the Berkshire Cotton Mfg. Co., was presented by the help on leaving that mill with a fountain pen and a handsome set of cuff buttons. His successor, Bernard McKenna, on leaving the Berkshire Cotton Mfg. Co., was presented with a handsome gold watch chain.

Mr. Charles S. Burnett, master mechanic for the Pontiac Mills at Pontiac, R. I., has been succeeded by George Chase of Pawtucket, R. I., who formerly held the position.

Napoleon Montiville of Maple Grove, Mass., has been appointed overseer of spinning at the Forestdale Mfg. Co. of Forestdale, R. I.

E. G. Goodpastor, for many years manager of the Marysville Woolen Mills at Marysville, Cal., and for the past year in charge of a clothing store in Marysville, has accepted a position at Sacramento, Cal., with a large clothing house.

Burnham Brown has accepted a position as overseer of one of the departments at the Sawyer Mills, Dover, N. H., and succeeds Frank Swindell.

William Walmsley, overseer of weaving for the Bernon Mills, Georgiaville, R. I., has severed his connection with the company.

T. T. Tierney, superintendent of the Susquehanna Mills at Jersey Shore, Pa., has been transferred to the Marion, O., plant.

Ernest H. N. Wolstenholme, designer for the Dunn Worsted Mills, Woonsocket, R. I., has severed his connection with that company. He will take a much needed rest before engaging elsewhere.

George Schatcherd of Joseph Schatcherd Sons, Inc., of Germantown, Pa., manufacturers of woolen and merino yarns, died of paralysis at his home, 365 East Shelton Ave., after an illness of 8 years, at the age of 79. Mr. Schatcherd was born in England and came to this country when a boy. He assisted in founding the firm of Joseph Schatcherd Sons, manufacturers of woolen yarns at Shelton Ave. and Magnolia St., 45 years ago. He was the oldest Past Grand Knight of Mitchell Lodge of Masons, a member of the Germantown Chapter and the Germantown Commandery. He was affiliated with the Knights of Pythias and Odd Fellows and was a Senior Deacon of the First Baptist Church of Germantown. He is survived by a son, Judson, and a daughter, Mrs. A. R. Brownlee, five grandchildren and two great-grandchildren.

Roy Evans, overseer of carding at the New Bedford Mfg. Co., has accepted a position as superintendent for the Union Wadding Co., at Pawtucket, R. I.

George Rhodes has accepted a position as overseer of slashing, spooling and warping at the Suncook Mills, Suncook, N. H. He was formerly employed at Pawtucket, R. I.

Richard G. Riley has been appointed superintendent of the Gosneld Mills at New Bedford, Mass. He has been superintendent of the Davol Mills, Fall River, Mass.

C. T. Booth has accepted a position as overseer of carding for H. T. Murdock & Co., Proctorsville, Vt. He was formerly employed at Somersworth, N. H.

William Gates, overseer of weaving at the George's River Mills at Warren, Me., has severed his connection with that company, and is succeeded by George G. Wilson of Sabattus, Me.

Irving Johnson has been appointed superintendent of the A. Howarth & Sons Woolen Mill at Rochdale, Mass., and succeeds Benjamin Simmons.

Geo. Ray has been appointed overseer of spinning for the West Boylston Mfg. Co., Easthampton, Mass. He comes from the Taber Mills, New Bedford, Mass. He is succeeded at the Taber Mill by Gilbert Gasselin, overseer of ring spinning from No. 4 New England Cotton Yarn Co. Mr. Gosselin's successor is the second hand of the No. 3 Mill of the New England Cotton Yarn Co.

S. F. Sheldon, formerly designer at the Westerly Woolen Co., Westerly, R. I., has been appointed assistant superintendent and designer at the Camden Woolen Co., Camden, Me.

James S. Baine, for 31 years overseer of the yarn department at the Bigelow Carpet Company, Clinton, Mass., has severed his connection with that company. Mr. Baine came to Clinton in 1875 from Taftville, Conn., and was soon put in charge of the yarn room.

Anthony F. Moore has been engaged as superintendent of the N. E. Cotton Yarn Company's mill at Fall River, Mass. He was formerly employed at Holyoke, Mass.

S. N. Burgess has accepted a position as designer at the Dunn Worsted Mills, Woonsocket, R. I. He comes from the Earnsdale Worsted Co., Clinton, Mass.

Paul Van Holdenback has been appointed superintendent of the Cream City Net Co., Milwaukee, Wis.

Thomas L. Hadley, for a number of years master mechanic at the Manville Company, Woonsocket, R. I., has resigned to accept a similar position with one of the American Woolen Company's mills at Providence, R. I.

Frederick McDavitt has been appointed superintendent of the Maverick Mills, East Boston, Mass. He comes from Easthampton, Mass.

Ernest W. Tinkham, agent of the U. S. Worsted Co., Tinkham Mills at Harrisville, R. I., has severed his connection with that company and is succeeded by Geo. McCartney, who has been superintendent of this mill a number of years.

John Keenan, who resigned as superintendent of the bleaching department of the Southbridge Printing Co., Southbridge, Mass., in January of this year, has been reengaged to succeed Chester Hartley.

Jos. Brierly, for a number of years superintendent of W. C. Plunkett & Sons' mill, Adams, Mass., has been transferred to the Berkshire Cotton Mfg. Co., same town, to fill the position which was made vacant some time ago by the resignation of Clarence E. Benson. Mr. Benson held the posi-

tion as assistant superintendent. Mr. Brierley's position at W. C. Plunkett & Sons' mill as superintendent has been filled by Bernard McKenna, overseer of carding at the Berkshire Cotton Mfg. Co. Mr. McKenna's position as carder will be filled by Andrew Smith.

W. H. Gurley, overseer of weaving at the Sanford Cotton Mills, Sanford, N. C., has severed his connection with that company.

Ira D. Bridges has succeeded W. H. Gurley as overseer of weaving at the Sanford Cotton Mills, Sanford, N. C. He comes from Lynchburg, Va.

J. F. Pennington, superintendent of the Raeford Mills, Raeford, N. C., has resigned to accept the superintendency of the two mills at Dublin and Hawkinsville, Ga.

B. Nance has been promoted from assistant engineer to chief engineer at the Lancaster Cotton Mills, Lancaster, S. C.

R. R. Reif, master mechanic at the Lyman Mills, Holyoke, Mass., has been engaged for the position of master mechanic for the new Pacific Mills, which is under construction at Lawrence, Mass.

T. B. Howard has accepted a position as overseer of carding at the Mobile Cotton Mills, Mobile, Ala.

Geo. R. Turner has been appointed master mechanic at the Weldon and Shaw Cotton Mills, Weldon, N. C. He comes from Emporia, Va.

The many friends and acquaintances of Frank W. Brown, Sr., president of the Rome Soap Mfg. Co. of Rome, N. Y., will be grieved to hear of his death, which occurred recently at Utica, N. Y., while on a visit there with members of his family. Mr. Brown had a host of friends among the trade and was widely known to manufacturers throughout the United States and Canada. He is survived by a wife and eight children, several of the sons being associated with him in business. He was an important factor in the city's industrial life and was prominent in all works of charity. Mr. Brown was a member of all the prominent social clubs of the city and was a Mason and Knights Templar.

C. D. Barefield has taken charge of weave room No. 1 of the Avondale Mills, Birmingham, Ala. He comes from Eufaula, Ala.

J. W. Fleming has been appointed overseer of spinning at the Toxaway Mill, Anderson, S. C. He comes from the Riverside Mills, same town, where he held a position as second hand in this department.

C. L. Taylor, overseer of spinning at the Gainesville Cotton Mills, Gainesville, Ga., has resigned to accept a similar position with the Riverside Mills, Anderson, S. C.

O. L. Wagstaff has been appointed superintendent of the new Amazon Mills, Thomasville, N. C.

Geo. W. Watson, overseer of dyeing at the Locke Mills, Concord, N. C., has resigned.

J. W. Brown, overseer of spinning at the Lockmore Mills, Yorkville, S. C., has resigned to accept a similar position nights at the Harris Mfg. Co., Rock Hill, S. C.

Benj. R. Simmons, superintendent of the Rochdale Mills, A. Howarth & Son, Rochdale, Mass., and who had been employed by this company for 14 years, has severed his connection with that company.

Chas. Heeley has been appointed overseer of spinning at the Provo Woolen Company, Provo, Utah. He was formerly employed at Pittsfield, Me.

Luman S. Arnold, a former resident of Adams, Mass., and one of the best well known business men some years ago, died while on a visit at his son's home in Buffalo, N. Y., from an acute attack of indigestion which proved fatal. He was making his home at Syracuse, N. Y., and was the son of Silas Arnold, who had charge of the Arnoldsville Mill, known as the Arnold Print Works in the town of Adams some years ago.

Allan Moors has been appointed overseer of finishing at the Provo Woolen Company, Provo, Utah. He comes from Dexter, Me.

R. D. Cole, Sr., president of the Newman Cotton Mills, Newman, Ga., died recently. His death brought about a change in the official management of this mill. R. D. Cole, Jr., a nephew of the deceased, has been appointed president; M. F. Cole, first vice-president and general manager, and E. M. Cole, second vice-president.

Gilbert Robert Stitt, 23 years of age, and son of Peter Stitt, overseer of dyeing at the Broad Brook Mfg. Co., Broad Brook, Conn., died Thursday at his home of tuberculosis. He had been ill about three years and recently returned from Colorado Springs, where he had gone with the hope of regaining his health.

Geo. R. McDougall has been appointed overseer of carding at the Provo Woolen Company, Provo, Utah.

Geo. Sutcliffe, who recently accepted the position as superintendent of the Southbridge Print Works, Southbridge, Mass., has accepted a position at New Wareham, Mass., with a new company recently formed.

Wm. Tedd has been appointed overseer of weaving at the Provo Woolen Company, Provo, Utah. He was formerly employed at Beaver Dam, Wis.

Walter Crabtree has succeeded James Ramsey as overseer of spinning at the Plainfield Woolen Co., Central Village, Conn.

W. T. Adams has severed his connection with the Muskegon Knitting Mills, Muskegon, Mich., to accept the position of superintendent of the Hickory Hosiery Mills, Hickory, N. C.

Elnor J. Tator has accepted a position as superintendent of the Appalachian Knitting Mill, Knoxville, Tenn. This concern will manufacture high grade men's underwear. Mr. Tator was for

several years with the Standard Knitting Mills and left June 1 to take up his new duties with this company. He is succeeded at the Standard Knitting Mill by E. J. McMillan, son of the president, E. E. McMillan.

Robert L. Currie, overseer of knitting at the Winsted Hosiery Company, Winsted, Conn., has severed his connection with that company. He is to accept a similar position in New York City.

James Riley has been appointed overseer of spinning at the Standard Spinning Company, Oswego, N. Y. He comes from the Bennett Mills, New Bedford, Mass.

DEATHS.

Robert Lincoln Lippett died at his home on 29 Orchard Ave., Providence, R. I., at the age of 50 years. Mr. Lincoln was at one time agent and manager of the Lippett Woolen Company, Woonsocket, R. I., and a director of the Manville Co.

Joseph Smalley, a retired hosiery manufacturer, died at his home in Germantown, Philadelphia, Friday, June 17. He was born in England and came to this country about 75 years ago. He was 81 years of age at the time of his death and is survived by 7 children.

Samuel Aldrich Crozer, manufacturer and philanthropist, died at his home in Upland, Chester, Pa., at the age of 85 years. He was born at West Branch Aston Township, Delaware Co., in 1825, and is survived by a wife and five children. He established the cotton mill at Upland, Pa., known as S. A. Crozer & Son and operated this mill continually on full time. He also established the Crozer Steel & Iron Co. of Roanoke, Va., and was a member of the Union League of Philadelphia for twenty years. He also had a Philadelphia residence.

Charles Mason Beach, widely known in business circles in Connecticut, died at West Hartford, Conn. He was 84 years of age and with his brother was a pioneer in the silk dyeing industry at one time.

Henry Greenwood, who was employed for a number of years as overseer of spinning at the Geo. H. Gilbert Mfg. Company, Ware, Mass., and who resigned some time ago, died at his home at Worcester, Mass., at the age of 78 years.

La Fayette Lanier, president of the Lanett, Langdale Shawmut and Riverside Mills, also president of the Chattahoochie R. R. Co., died at his home at Lanett, Ala., at the age of 65 years. He is survived by six children.

Edwin T. Marble died at his home in Worcester on July 3d. Mr. Marble was born in Sutton, Mass., Aug. 18, 1827, and at the time of his death was one of Worcester's foremost business men.

After attending school in his native town, he came to Worcester in 1841 and at the age of eighteen began to work in the machine shop of Albert Curtis, where he served an apprenticeship of three years. He worked a number of years as journeyman, foreman and superintendent in various machine shops in Worcester and in 1863 purchased an interest in the business of Albert Curtis, builder of woolen finishing machinery, the new firm being Curtis & Marble. The business grew steadily and in time Curtis & Marble became one of the best known builders of textile machinery in the country. In 1895 Mr. Marble bought Mr. Curtis' interest in the business, becoming sole proprietor and incorporating the company under the name of the Curtis & Marble Machine Co. in December of that year.

Mr. Marble was elected to the Worcester Common Council in 1866, a representative to the General Court in 1870 and was elected to the State Senate in 1887. He was a director of the Worcester Public Library for the last six years of his life, a member of the Worcester Mechanics' Association, a director of the Worcester Trust Co., vice-president of the People's Savings Bank and vice-president of the Home for Aged Men. Mr. Marble is survived by four sons, all of whom are associated with the company.

George Dexter of Commonwealth Ave., Boston, died at his summer home at Pride's Crossing from the effects of stomach trouble. He was born in Boston in 1834 and while a young man went West to New Orleans, where he entered the cotton business with a large shipping firm. He soon mastered every detail of the business and had an expert knowledge of cotton. He also kept in close touch with the foreign market. He returned to the New England States and again entered in cotton manufacturing. At the time of his death Mr. Dexter was a director of the Amoskeag Mfg. Co. of Manchester, N. H., Boston Manufacturers' Mutual Fire Insurance Co., Edison Illuminating Co., Essex Co., Mass. Hospital Life Insurance Co., National Union Bank, N. E. Trust Co., and the Pepperell Mfg. Co. of Biddeford, Me. He leaves a son, Wm. E. Dexter and is also survived by a widow.

J. G. Atkins, who established the lace industry in this country in 1885, died at his home in Kingston, Pa., of a complication of diseases at the age of 55 years. From a small beginning the plant which Mr. Atkins established in Wilkesbarre, Pa., now employs about 1,500 hands.

Richard Waterhouse, one of the best known woolen manufacturers in the State of Rhode Island, who owned and operated the Greenville Woolen Mill, Greenville, R. I., died at his home in Greenville, Wednesday, July 13. He was born in Yorkshire, Eng., Apr. 8, 1836. At the age of 11 years he became an operative in the Pokeville Mills operated by Poke & Steer. He was afterwards employed at the Kent Woolen Mills, Centerville, R. I., and was superintendent at one time of what is now known as the Hecla Mill, Uxbridge, Mass. He afterwards took the position of superintendent of the mill at Blackstone, Mass., now known as the Saranac Mill. He is survived by a wife and three children, James Waterhouse, who is superintendent of the Waterhouse & Howard Mill at North Adams, Mass., Mrs. Minnie Wardman and Mrs. Annie Green of Woonsocket, R. I. Also survived by two brothers and four sisters.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The Official American Textile Directory for 1910-11; compiled by the Textile World Record; 700 pages; 23 textile maps; Lord & Nagle Company, Boston, New York and Philadelphia, publishers; Office Edition, $3.00; Travelers' Edition, $2.00.

The new directory maintains the standard set by previous editions and in many ways is an improvement over any directory of the textile trade previously compiled. The past year has been a period of great changes. Scores of mills have gone out of business, or have been taken over by new companies and between three and four hundred new plants have been started. In addition there have been thousands of changes in mill officers, mill equipment and in the products of old-established mills. These are all accurately given in the mill section of the directory.

The Raw Materials section and the departments of Yarn Dealers, Selling Agents and Classified Lists have been accurately revised up to July 15.

Great strides have been made in compiling trade directories and the lead in the textile field at least was taken by the Textile World Record publications. Their development of textile map features, classified indexes and simple, self-indexing arrangements, features designed to save time and increase the usefulness of directories, mark some of the steps taken. Finally the canvassing of the whole industry by representatives and by mail, a few weeks before the publication of the directory, verifying and amplifying reports which had come in from time to time, was worked out, bringing the information close to the date of publication and insuring the highest degree of accuracy. To do this successfully extended reporting and news-gathering facilities are necessary. The publishers, being also the publishers of the Textile World Record, have the services of an extensive organization in this work, which cannot be equalled by smaller publishers of books of this character.

Some of the special features of the Official Directory are as follows: A complete directory of textile mills of all classes, with full information, such as name of company or firm, names of officers, character of goods made and machinery equipment.

Copyrighted maps, by which any town referred to in the text can be quickly located on the map. There are twenty-three of these textile maps, which show only the cities and towns where there are textile establishments and junction points. Railroad facilities, distance from other towns, etc., are shown.

A yarn trade index, which gives a classified list of manufacturers of different kinds of yarn who spin for the market; sizes of yarns spun and the way it is put up are given.

A classified list of cloth manufacturers, giving the classes of goods manufactured in every mill.

A commission and order section, giving classified lists of establishments doing all sorts of dyeing, bleaching, finishing, mercerizing, etc., on order for manufacturers and converters.

A list of mills with worsted machinery for the convenience of those dealing exclusively with that branch.

In this edition indexes have been printed on different colored paper from the mill reports, enabling quicker reference to the section desired. The running headings at the top of pages have been made to show at a glance the contents of each page.

Other features are an alphabetical index, dealers in raw materials, lists of manufacturers of and dealers in cotton and woolen waste, shoddy and flocks, selling agents and dry goods commission houses, machinery and supply section, and a list of the textile associations in the United States and Canada, with officers, addresses, etc.

In preparing the directory simplicity of arrangement has constantly been aimed at. Information, when wanted, is wanted immediately, and with anything but the most simple arrangement in a book of the extent of a complete textile directory, much time is wasted looking for information. This fact is not always given the attention it deserves from publishers.

Wool Growing and the Tariff; by Chester Whitney Wright; 362 pages, 5 1/2 by 8 3/4; Houghton Mifflin Co., Boston.

The author of this volume has succeeded in compiling a valuable book of reference, and his comments and what he has accepted as facts are instructive and fair. There can be no question as to the scientific spirit with which the book has been written. It is a matter of regret, however, that the statistics of the wool trade are so unreliable as to impair the value of all speculations based on them. That is a fact, however, and Mr. Whitney suffers from it. To be of real value statistics must possess something besides length, breadth and well arranged details; and that something must be a basis of fact. In spite of this defect, however, this is a useful book which should be within reach of every student of the wool tariff.

The Blue Book Textile Directory; Davison Publishing Co., 407 Broadway, New York. Office Edition, $4.00; Travelers' Edition, $3.00.

A copy of the office edition of this familiar book has been received and gives evidence of the usual careful preparation. It includes a directory of textile manufacturers in the United States and Canada; dry goods commission merchants, yarn dealers, lists of chemical and dyestuff manufacturers and dealers, textile machinery, etc. The book is well printed and bound.

Business Literature.

The Fog Horn; G. M. Parks Co., Fitchburg, Mass.

The July issue of this organ brings the turbo-humidifier news up to date, giving much interesting information regarding this humidifier. There is also a long list of firms which have installed the turbo-humidifier, many of them having placed duplicate orders.

The C. W. Hunt Co.

Arrangements have been made by the C. W. Hunt Company, New York, builders of coal handling, conveying and hoisting machinery, by which their business on the Pacific coast will be handled by the San Francisco Bridge Co., with offices at 865 Monadnock Bldg., San Francisco. The company has just completed a naval coaling station in San Francisco Bay for the Government.

The Hohmann & Maurer Company.

The branch managers and principal salesmen of the Hohmann & Maurer division of the Taylor Instrument Companies held their annual "get-together" meeting July 14-16 inclusive, at the factory in Rochester, N. Y. Three busy days were spent by the officers of the company and the men in reviewing general business conditions as related to H. & M. type thermometers, also the Tycos Hygrodeik for recording humidity.

The company is just closing its most successful year and the sales force, to a man, is enthusiastic over the outlook for passing all records in the year 1910-1911.

A new woodworking shop is one of the several additions to the plant of the Taylor Instrument Companies. This building, measuring 100 by 150 feet, will be used exclusively for the preparation of lumber entering into the products of these companies. A dry kiln, for the drying of its own lumber, is also under construction.

Aside from these buildings, a new wing is being added to the main factory building, which will give greatly increased facilities in the handling of finished products. These buildings will add more than 40,000 square feet of floor space to the present plant.

Rochester, N. Y., is unique in ranking first among the cities of the world in importance in the thermometer industry, and is rapidly coming to be known all over the world as the city "where the thermometers come from."

Double Beams and Fire Risk.

Pointing out certain bad practices in mill construction, F. W. Dean of Boston, mill engineer and architect, called attention in a recent paper to a particular fire danger in connection with floor beams. "If the weight is so great that the main beams are composed of two pieces of timber side by side and bolted together," says Mr. Dean, "no space should be allowed between them (as was formerly advised on account of better seasoning and possible avoidance of dry rot), because in case of fire the space between them holds fire for a long time and prevents its extinction. It was only as recently as the fire in the Cocheco Mills at Dover, N. H., that this was realized. Except for the persistence of the fire between the double beams of this mill, mill construction in this case amply justified its common appellation of being 'slow burning,' and a splendid fire risk."

Recent Orders.

Among the orders recently booked by the Crocker-Wheeler Company of Ampere, N. J., are the following:

Two 1,000 k. w. engine type generators for the Republic Iron & Steel Co., Hazleton plant.

One 500 k. w. engine type generator for A. M. Byers Co., Pittsburg, Pa.

One 300 k. w. engine type generator for the H. Lauter Co., of Indianapolis.

One 175 h. p. auxiliary pole motor for the Orford Copper Co., of New Jersey.

One 1,000 k. v. a. engine type A. C. generator and one 150 k. v. a. engine type generator for the Big River Lumber Co., of Saskatchewan, Can.

One 150 k. v. a. engine type A. C. generator with exciter for the town of Julesburg, Col.

One 300 k. v. a. belt type A. C. generator with exciter for the York Card & Paper Co., of Pennsylvania.

Two 500 k. w. synchronous motor-generator sets for the new Gary plant of the American Sheet & Tin Plate Co.

Copper Stamps.

The American Print Cutting Co., 515 Morgan St., Union Hill, N. J., is making a specialty of making copper stamps, also blocks made in brass, wood or type, for hand printing designs, trade marks, etc., on textile fabrics. They also make rollers for machine printing. Stamps for the China trade, chop designs and trade marks are made by this concern which was started for the express purpose of catering to the wants of textile manufacturers, selling agents, and exporters.

The practical experience of the men connected with it, together with their excellent plant and facilities, has made it a successful enterprise.

The Arabol Mfg. Co.

The Bellicosa softener is made by the Arabol Mfg. Co., 100 William St., New York, and recommended as an article that is economical and easy to handle. It comes in powder form and the manufacturer does not need to prepare any more than is necessary for the job on hand. Since it does not work well with acid blue, the Arabol Co. has prepared a special blue which, when used with Bellicosa, will not show any shading off or irregular color.

Taylor Stokers.

At the recent convention of the International Association for the Prevention of Smoke, at Minneapolis, Minn., Mr. R. S. Riley, President of the American Ship Windlass Co., Providence, R. I., read an instructive paper on "Taylor Stokers and Steam Boiler Efficiency," in which he showed by numerous illustrations the principles of construction and operation in their relation to increased efficiency.

Rainbow Falls Power Plant in Operation.

The first two units of 6,000 h. p. each of the Rainbow Falls Development at Great Falls, Mont., have recently been successfully started. According to Chas. T. Main, of Boston, the engineer in charge of this work, the other four units of 6,000 h. p. each in this development will be in operation some time in August. The Rainbow falls is the second largest of the five falls in the Missouri River at Great Falls, Mont., having a fall of 54 feet. There is an aggregate drop of 535 feet in the Missouri River within five miles, with a total possible development of about 350,000 h. p.

Mr. Main is also the engineer for the work being carried on at Great Falls.

Annual Meeting of Sturtevant Sales Force.

The B. F. Sturtevant Company, Hyde Park, Mass., the large manufacturers of fans, blowers, fuel economizers, and mechanical draft apparatus are so well known to everybody in the manufacturing line and their salesmen are known personally to so many architects and engineers, that it is a matter of interest to note their Salesmen's Convention recently held.

The Branch Office managers and principal salesmen from all over the country assembled at the works and general offices at Hyde Park and spent four very busy days in going over general business matters. Their evenings were enlivened by banquets and other social features.

The last day of the convention closed by a delightful sail down the harbor and an afternoon and evening as the guests at the Cohasset home of Mr. E. N. Foss, treasurer of the company.

The Convention was marked by great enthusiasm as the company has just finished July 1st the largest business year in its history.

HEADS OF DEPARTMENTS AND SALES FORCE B. F. STURTEVANT CO.

The large multivane wheel in the background is for tunnel ventilation.
The small multivane wheels held by the men are used in the Sturtevant Ready-to-run Electric Ventilating Sets.

Purifying Water.

That operating steam boilers with bad feed water is wasteful and dangerous, every engineer will admit.

To obtain the full efficiency of a steam plant the boilers must be clean all the time. That the boilers can be clean only by feeding them with water free from scale-forming and corroding substances is self evident.

That steam plant owners are realizing more and more the necessity of clean boilers is evidenced by the number of orders placed with Wm. B. Scaife & Sons Co. of Pittsburg, Pa., manufacturers of the Scaife and We-Fu-Go water softening and purifying systems, not only for steam boiler feed use, but for other industrial uses. The following are some recent orders for the Scaife and We-Fu-Go Systems received by them: Carnegie Coal Co., Oakdale, Pa., 750 h. p. We-Fu-go System; Boston Rubber Shoe Co., Fels, Mass., 900 h. p. Syphon

THE UNIVERSAL WINDING CO.'S FIRST ANNUAL FIELD DAY.

System; Twin State Gas & Electric Co., Dover, N. H., 575 h. p. We-Fu-Go System; American Sheet & Tin Plate Co., Gas City, Ind., 1,800 h. p. We-Fu-Go System; Wickwire Steel Co., Buffalo, N. Y., 3,000 h. p. addition to present 6,000 h. p. We-Fu-Go System; Cleveland Hardware Co., Cleveland, O., 1,000 h. p. We-Fu-Go System; Pocahontas Cons. Collieries Co., Switchback, W. Va. 5,000 h. p. We-Fu-Go System; Harkness & Gowing Co., St. Bernard, O., 300 h. p. We-Fu-Go System; Astoria Veneer Mills, Long Island City, N. Y., 1,100 h. p. We-Fu-Go System.

The Green Fuel Economizer Co.

The Berlin Construction Co. has received the contract for rebuilding the fan shop of The Green Fuel Economizer Co., at Matteawan, N. Y., which was almost totally destroyed by fire some weeks ago. It is expected to have the new building erected and complete, ready for occupancy, about the middle of August. The new shop will have about 25 per cent. more floor space than the old shop, including a test room fully equipped with chambers, gauges, etc., suitable for making exhaustive tests on the capacity, pressure and efficiency of the improved fans built by this concern for heating and ventilating, mechanical draft, and other services. The new building will be of steel construction throughout and will be heated by the hot blast system, with frequent outlets near the floor to secure uniform distribution of the heat. This system has been applied by The Green Fuel Economizer Co. with great success in several buildings, that were peculiarly difficult to heat, such, for instance, as the new foundry of the Waterbury Castings Co., where the wall surface is almost entirely of glass.

"Universal" Field Day.

The Universal Winding Company of Boston gave its first annual outing and field day to the employes of its Providence plant on Saturday, July 16. The party boarded special cars early in the forenoon and went to Boyden Heights, a shore resort on beautiful Narragansett Bay, where athletic sports and games were enjoyed. The feature event of the day was a motor boat race in which there were five entries of craft owned and manned by Universal employes. The first prize, a beautiful silver cup donated by the Pairpoint Corporation of New Bedford, was won by George Taylor in the "Echo." All the members of the party were supplied with large megaphones, also given by the Pairpoint Corporation, and these enabled the people on the wharf to give directions and cheering remarks to their favorites on the boats.

About noon a Rhode Island clambake was served and after dinner the Treasurer of the Company, Mr. Robert A. Leeson, of Boston, made a brief address to the men. The President, Mr. Joseph R. Leeson, being abroad on an extended business trip could not be present, but sent his regrets through his son.

During the course of his remarks the Treasurer gave some interesting facts concerning the Universal Winding System and Universal machines.

He stated that Universal Winding Machines are employed in the manufacture of practically every fabric worn by, or of use to, mankind, as well as for the production of material used in the transmission of sound, light, heat and power. They are today in successful operation in about thirty-four states of the union; in Canada, Mexico, Columbia, Brazil, Argentina, and several other of the South- and Latin-American countries; in Great Britain, including England, Ireland, Scotland and Wales; on the continent, in Spain, Portugal, Italy, France, Germany, Holland, Belgium, Denmark, Norway, Sweden, Russia, Austria-Hungary; to a limited extent in some of the countries of the near East, such as Servia, and to a large extent in India, China, Japan and Australia.

Besides the Treasurer, there were present from Boston the Secretary, Mr. Frederick H. Bishop, Mr. French and Mr. Warren. Among the traveling representatives present were Mr. Parks of the Providence Office, Mr. Lowe of the New York Office, Mr. Babcock of the Philadelphia Office, and Mr. Hathaway of the Southern Office. Representatives of the following business houses were invited as guests: Pairpoint Corporation, F. F. Carpenter Lumber Co., Thomas & Lowe Machinery Co., Salisbury & Nightingale, Belcher & Loomis, Westcott Slade & Balcom, New England But Co., E. C. Bliss Mfg. Co., Providence Enamel Co. and Staples Express Co. The affair was under the direct supervision of an advisory committee, composed of Arthur I. Harvey, Factory Manager, and William A. Booth, Superintendent.

After a ball game between two teams from the shop the party returned to the city in the evening and all pronounced the outing an unqualified success.

Artificial Indigo.

"De Indische Mercuur" of April 5 states that Dr. Rathger and Herr Stephan have devised a new process for the manufacture of this dyestuff, which is cheaper to work than the processes now in use. The inventors propose to erect a factory capable of producing about one-third of the world's consumption of indigo. It is estimated that last year the production of artificial indigo amounted to about 16,000 tons, valued at m.41,000,000. It is stated that the Badische Co. are quite prepared to meet this or any other competition. Definite information regarding the new undertaking is not easy to obtain, but matters are said to be in an advanced stage, and that the plant to be erected will be capable of supplying about one-third of the world's indigo requirements. If the new concern is pressed forward, an indigo-trade war is possible, the ultimate result of which will, of course, depend chiefly on the relative merits of the various processes, with the later probability of an indigo-cartel if the new process justifies the hopes of its financial backers. The new method is said to be similar in principle to the Sandemeyer process, patented and worked for a time by the Swiss color-firm the Anilinfabriken und Extractfabriken, formerly J. Geigy, Basle. From the scientific point of view the process is of great interest, but, owing to the technical difficulties in the way of commercial production, it was abandoned, and the patents were allowed to lapse. Dr. Rathjens now claims to have overcome these difficulties so completely that the process will be more than capable of holding its own and the proof or disproof of these claims is a matter of importance to many besides the actual makers.

Humidity in Massachusetts Textile Mills.

Following is the text of an act recently signed by Governor Draper and which goes into effect on June 22, providing regulations for humidification of the air in Massachusetts textile mills:

Chapter 543, Commonwealth of Massachusetts, 1910. An act relative to regulating the humidity and temperature of the atmosphere in textile factories.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

Section 1. In every weaving and spinning department in a textile factory wherein water is introduced for humidifying purposes there shall be provided, maintained and kept in correct working order, for the purpose of recording and regulating the humidity of the atmosphere and the temperature, at least one set of standardized wet and dry bulb thermometers, and, if required by a State inspector of health, two sets of such thermometers, and the following regulations shall be observed in the use of thermometers: (a) The thermometers shall be placed as directed or sanctioned by a State inspector of health and shall be plainly visible to the workers. (b) The occupier or manager or person for the time being in charge of the weaving or spinning department in question shall read the thermometers thrice in the day, namely, between 7 and 8 o'clock in the forenoon, between 10 and 11 o'clock in the forenoon and between 3 and 4 'clock, except in rooms which are lighted by gas and then between 4 and 5 o'clock, in the afternoon of every day on which any persons are employed in any weaving or spinning department and shall record the readings of each thermometer in such department at each of these times upon a form provided for the purpose, which, together with regulations relating thereto, shall be furnished by the State Board of Health. The records of the readings shall not be destroyed until they have first been seen by the State inspector of health in whose district the factory is located, and then not without his knowledge and consent.

Sec. 2. Section one shall not apply to textile factories already equipped with, or which become equipped with, such a number and type of standardized self-registering hydrometers, or psychrometers, or hygrometric system, as meet the approval of the State Board of Health, provided the manner of using the same is approved by the State inspector of health in whose district the factory is situated, and provided the records of the readings from the said hygrometers, or hygrometric system installed, are not destroyed without the knowledge and consent of said inspector.

Sec. 3. Section one shall not apply to textile factories the occupier or manager or person in charge of which makes use of the sling hygrometer

with the express purpose of quickly and accurately determining the actual moisture and temperature of a weaving or spinning department as frequently and in such a manner as is approved by the State inspector of health in whose district the factory is situated, and provided the records of the readings from the use of the said hygrometer are not destroyed without the knowledge and permission of said inspector.

Sec. 4. No owner, occupier or manager or person for the time being in charge of a textile factory shall permit the relative humidity in a weaving or spinning department in the textile factory under his control to exceed the following limits:

I. Thermometer readings Dry bulb deg. F.	II. Wet bulb deg. F.	III. Percentage of humidity.
60	58	88
61	59	88
62	60	88
63	61	88
64	62	88
65	63	88
66	64	88
67	65	88
68	66	88
69	67	88
70	68	88
71	68.5	85.5
72	69	84
73	70	84
74	70.5	81.5
75	71.5	81.5
76	72	79
77	73	79
78	73.5	77
79	74.5	77.5
80	75.5	77.5
81	76	76
82	76.5	74
83	77.5	74
84	78	72
85	79	72
86	80	72
87	80.5	71
88	81.5	71
89	82.5	71
90	83	69
91	83.5	68
92	84.5	68
93	85.5	68
94	86	66
95	87	66

Sec. 5. Water used for humidifying purposes in a textile factory shall be taken either from a public supply of drinking water, or from some other source of pure water, or from a supply of water which, although in the opinion of the State Board of Health may not be suitable for drinking purposes, is sufficiently free from impurities as not to be dangerous to the health of employes when used for humidifying purposes; and all ducts for the introduction or distribution of humidified air shall be kept clean.

Sec. 6. This act shall be enforced by the State inspectors of health under the supervision of the State Board of Health. Whoever fails to comply with the provisions contained herein after being requested so to do by a State inspector of health shall be fined not more than fifty dollars for each offience.

Sec. 7. To provide for the expenses necessary in carrying out the provisions of this act with and in connection with and in addition to the duties provided for by chapter 537 of the acts of 1907 there may be expended out of the treasury of the Commonwealth annually a sum not exceeding $1,000 in addition to the $5,000 provided for by Section 7 of said Chapter 537.

Adulteration of Wool.

While the farmers are complaining of the low prices of wool, manufacturers and dealers still complain of the manner in which some unscrupulous woolgrowers prepare their wool for market. An article taken from the Textile World Record of June, 1908, has been sent to us in regard to the twine used in tying up fleeces and the improper things put in them.

Sisal or binder twine is sometimes used to tie wool, the fibers get mixed up with the wool and are difficult of extraction. A picture is given of a bunch of 12,000 fibers picked from one day's work of a worsted mill and pictures of worsted cloth are shown with sisal fibers in them. Sisal should not be used for such a purpose. A picture is given of a piece of twine measuring 121 feet and weighing 1/4 pound found in an Ohio fleece.

There is another of one of 22 lambs' tails found in other Ohio fleece, and it is stated that a lady's garter was found in another Ohio fleece. The Boston man wonders how it got there. He don't say what the garter is made of, and so it is no use to try to allay the Bostonese wonder. The majority of woolgrowers are honest and put up their wool in as good shape as they can. For the dishonest ones Ohio law provides as follows:

Unlawful Sale of Certain Kinds of Wool. R. S. 7069 (Sec. 3).—Be it enacted by the general assembly of the State of Ohio, that it shall be unlawful for any person or persons to sell any wool washed on sheep's back or otherwise, containing any unwashed tag locks, or any unwashed wool of any kind, or black wool or parts of bucks' fleeces, or other substance foreign to the fleece or fleeces, which is calculated and intended to defraud the purchaser thereof.

Penalty. R. S. 7069-4 (Sec. 2).—Any person or persons guilty of violating the provisions of Section 1 of this act shall be fined not less than $25 nor more than $100 or imprisonment not less than thirty days nor more than ninety days or both, at the discretion of the court.—Athens (O.) Tribune.

The American Ship Windlass Co., Providence, R. I., manufacturers of the Taylor gravity underfeed stoker, report the following orders: Three stokers for the Cambria Steel Co.; six stokers to be used with six 600 h. p. Stirling boilers at the Worcester Electric Light Co.; four stokers to be applied to four 1250 h. p. Hornsby boilers at the Hartford Electric Light Co.; and one stoker for the Lackawanna Steel Co.'s plant at Lackawanna, N. Y.

Recent Textile Patents.

BOBBIN HOLDER and Yarn Catcher. Combined. 964,084. William C. Bosswell, Rossville, Ga.

BRAIDING MACHINE Carrier. 962,522. Edward F. Parks and Simon W. Wardwell, Providence, R. I.

CLOTH DOUBLING and Folding Machine Attachment. 962,193. Andrew J. Bohnengel, Toledo, O.

FABRIC BORDERS. Machine for Making. 965,001. Herbert S. North, Rahway, N. J.

FABRIC CLASP. 965,143. Francis W. Harkins, Chicago, Ill.

FABRIC LAYING and Folding Machine. 964,124. Morris L. Shapera and Charles M. Shapera, Chicago, Ill.

FABRIC STRETCHING Machine. 964,088. Franklin Chatfield, Minneapolis, Minn.

KNITTED FABRIC. 963,744. Horace A. Carter, Needham Heights, Mass.

KNITTED FABRIC. 963,864. Horace A. Carter, Needham Heights, Mass.

KNITTING. 963,227. Edward E. Kilbourn, New Brunswick, N. J.

KNITTING MACHINE. Circular. 962,292. Arthur N. Ames, Franklin Falls, N. H.

KNITTING MACHINE. Circular. 963,679. George L. Ballard, Norristown, Pa.

KNITTING MACHINE. Circular Fashioning. 962,291. Arthur N. Ames, Franklin Falls, N. H.

LOOM. 963,100. John C. Williams and Edwin J. Cotter, Augusta, Ga.

LOOM. Automatic Weft Replenishing. 964,557. Charles F. Roper, Hopedale, Mass.

LOOM. Automatic Weft Replenishing. 964,580. Edward S. Stimpson, Hopedale, Mass.

LOOM. Automatic Weft Replenishing. 964,582. Melvin L. Stone, Hopedale, Mass.

LOOM for Manufacturing Terry Fabrics. 961,866. Gustav Kratky, Freudenthal, Austria-Hungary.

LOOM SHUTTLE. 964,872. John Johnson, Woonsocket, R. I.

LOOM PICKER Check. 962,802. Sakichi Toyoda, Nagoya, Japan.

LOOM for Weaving Double Pile Fabrics. 962,286. George Zimmerman, Philadelphia, Pa.

LOOMS. Pick Matcher for Automatic Weft Replenishing. 964,555. Alonzo E. Rhoades, Hopedale, Mass.

LOOMS. Pick Matcher for Automatic Weft Replenishing. 964,497. Paul Day, Hopedale, Mass.

LOOMS for Weaving. Dobby for. 964,256. Edward Hollingworth, Dobcross, Eng.

LOOMS. Contrivance for the Tension of Weft Wire with Wire Gage. 964,150. Oskar Eilhauer, Neustadt-on-the-Oria, Germany.

LOOMS. Filling Feeder or Magazine for Automatic. 962,581. Severin N. Paquette, Lowell, Mass.

LOOMS. Lay for Narrow Ware. 962,183. William Wattie, Worcester, Mass.

RIBBON FEEDING Mechanism. 964,851. Robert B. Craig and Albert Coffman, Kansas City, Mo.

SHUTTLE-THREADING Machine. 962,327. Joseph Faltus, Fall River, Mass.

SHUTTLE. 961,817. Merrill O. Steere, Pawtucket, R. I.

SHUTTLES. Device for Preventing Rebound of. 962,495. Henry Cote, West Warren, and Renceler C. Snow, Ware, Mass.

SINGEING TEXTILE Fabrics. Device for. 962,828. Gustave Gin, Paris, France.

SPINNING and Other Purposes. Producing Durable Solutions for. 962,770. Rudolph Linkmeyer, Bremen, Germany.

TEXTILE FABRIC. 963,014. George H. Smith, Easton, Pa.

THREAD-COATING Machine. 962,260. Jarrot L. Rollins, Colfax, Cal.

WARPING MACHINE. 964,366. Frederick L. Atherton, Paterson, N. J.

WARP-PRINTING Machines. Prismatic Drum for. 964,023. Alfred Hofmann, Gottenborg, Sweden.

WARP THREADS. Means for Clamping and Stretching. 963,871. Howard D. Colman, Rockford, Ill.

YARN CARRIER for Warp Printing Machines. 964,022. Alfred Hofmann, Gottenborg, Sweden.

Recent Textile Trade Marks Registered.

"Ragalia." Broad Silk. Rogers & Thompson, West New York, N. J.

"Fresco." Worsted Cloth Piece Goods. Martin Sons & Co., Huddersfield, Eng.

"L S E." Doilies, Centerpieces, etc. Parkes Machine Co., Brooklyn, N. Y.

"Elite." Knit Scarfs and Mufflers. N. J. Rich & Co., Cleveland, O.

"Dreadnought." Knit Scarfs and Mufflers. N. J. Rich & Co., Cleveland, O.

"Great Western." Gloves, Mittens and Fur Coats. Ellsworth & Thayer Mfg. Co., Milwaukee, Wis.

"Parrot." Hosiery. E. M. Townsend & Co., New York.

"Sundown." Dress Goods in the Piece. The Michau & Co., Paris, France.

"Felicity." Worsted Yarn Wound with Mercerized Cotton. Bernhard Ulmann & Co., New York.

"Sumor." Ginghams, Shirtings, etc. G. A. Stafford & Co., Greenwich, Conn.

"Minerva." Hosiery. Marshall Field & Co., Chicago, Ill.

"Acme." Percales. Carson, Pirie, Scott & Co., Chicago, Ill.

"Passumpsic." Cotton Piece Goods. Boott Mills, Lowell, Mass.

"Argyle." Cotton Piece Goods. Boott Mills, Lowell, Mass.

"Hancock." Cotton Piece Goods. Boott Mills, Lowell, Mass.

"Bennington." Cotton Piece Goods. Boott Mills, Lowell, Mass.